A Dissertation On

EFFECT OF SPECIFIC ACUPUNCTURE AND LOCAL ACUPUNCTURE POINTS ON OSTEOARTHRITIS OF KNEE-A COMPARATIVE CLINICAL STUDY

Submitted By

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The Institution Ethical Committee of Government Yoga & Naturopathy Medical College Hospital, Chennai reviewed and discussed the application for approval of **"EFFECT OF SPECIFIC ACUPUNCTURE AND LOCAL ACUPUNCTURE POINTS ON OSTEOARTHRITIS OF KNEE – A COMPARATIVE CLINICAL STUDY"** for project work submitted by Dr. K.SATHYAM, 2nd Year M.D. Acupuncture & Energy Medicine, Post Graduate, Government Yoga & Naturopathy Medical College & Hospital, Chennai – 600 106.

The proposal is APPROVED.

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Above all thank God for all that I am blessed with.

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ABSTRACT

BACKGROUND

Osteoarthritis (OA) is accepted as a major public health problem. It is one of the major causes of impaired function that reduces quality of life worldwide. OA is a very common disorder affecting the joint cartilage. As treatments currently focus on management of symptoms, pain relief, improved joint function, and joint stability are the main goals of therapy. So acupuncture were often prescribed with the intention to alleviate pain and increase mobility. However, non pharmacological methods has to be performed on a regular basis in order to counteract muscle and degeneration of bones, This article presents on overview of the current knowledge on OA and focuses on etiology, diagnosis and treatment strategies, conservative treatment including the physical therapy management are discussed. Osteoarthritis and acupuncture as integrated holistic approach in this study discussed.

METHODS

A total of sixty subjects, mean aged (59.90 ± 6.64) were randomly assigned into two groups after satisfying the inclusion and exclusion criteria. Local acupuncture group (LA, n=30) and specific acupuncture group (SA, n=30). Both groups were assessed at baseline and after 14 days for WOMAC index, pain, stiffness, physical function, range of motion. During these 14days the local acupuncture points given Stomach st35 (dubi), spleen9 (yinlingquan), extrameridian31 (heding) and specific acupuncture points urinary bladder (UB11) dashu and gall bladder GB39 (xuqnzhong) once daily for twenty minutes.. Finally local group (n=30) and specific group (n=30) were completed the study.

RESULT

There was evidence of changes in the WOMAC INDEX between local and specific acupuncture. Within the local acupuncture group showed significant change in the extension in pre test in both the legs 173.20 (1.8). This study shows a significant increase in the range of movement (flexion) in local acupuncture group in both the legs ($p<0.001$). In the specific acupuncture group showed significance in the post study in flexion ($p<0.001$) and in the extension. Duration of conducting the intervention is a key factor in showing positive changes in the results.

INTERPRETATION AND CONCLUSION

Fourteen days combined needling of local acupuncture points group and specific acupuncture point group for osteoarthritis individuals showed progress of physical functional activity and less progress in pain and stiffness. Minimal Changes in the range of motion of degree of extension and moderate change in the degree of flexion, in the post study is noticed.

Keywords : OA; Knee pain; Pain severity; stiffness; physical function; acupuncture.

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LIST OF ABBREVATION

ACR	American College of Rheumatology
FX	Flexion
EX	Extension
OA	Osteoarthritis
NSAIDS	Non-steroidal Anti Inflammatory Drugs
NIH	National Institute of Health
TCM	Traditional Chinese Medicine
CAM	Complimentary Alternative Medicine
CNS	Central Nervous System
ROM	Range of Motion
PAG	Peri Aqueductal Grey
WOMAC	Western Ontario and Mcmasters Universities Osteoarthritis
VAS	Visual Analogue Scale
HAQ	Health Assessment Questionaries’
MOST	Multicentre Osteoarthritis
TENS	Transcutaneous Electrical Nerve Stimulator
TKA	Total Knee Arthroplasty

1.0 INTRODUCTION

It is a degenerative and chronic disease of the knee joint resulting from damage to hyaline cartilage and is the most common type of arthritis. Osteoarthritis (OA) is a major public health problem among the elderly and is associated with considerable disability.[1] Osteoarthritis refers to a clinical syndrome of joint pain accompanied by varying degrees of functional limitation and reduced quality of life. It is the most common form of arthritis, and one of the leading causes of pain and disability worldwide.

The most commonly affected peripheral joints are the knees, hips and small hand joints. Pain, reduced function and effects on a person's ability to carry out their day-to-day activities can be important consequences of osteoarthritis.[2]

Osteoarthritis of the knee is an important factor in health care cost in industrialized societies.

In Germany, costs directly attributable to osteoarthritis were estimated to be approximately 5.4 billion Euro in 1995 .Because there is no cure for osteoarthritis, most guidelines recommend a multimodal pharmacologic and non pharmacologic approach until total knee replacement is indicated.

Pharmacologic treatment generally consists of non-steroidal anti-inflammatory drugs, including cyclooxygenase-2 inhibitors and non-opioid analgesics.

Treatment is usually combined with patient education, social support, and physiotherapy. However, even this multimodal approach is often ineffective or has only short-term effects. The probability of adverse events increases with the duration of pharmacologic treatment.[3,4,5,6,7] knee osteoarthritis associated with mild to moderate disability.

Many patients with osteoarthritis have significant pain and loss of function, often episodically, and will require treatment to control their symptoms. Around 25% of those with knee osteoarthritis are severely disabled.

Every year, symptomatic knee osteoarthritis accounts for about 0.5% of all primary care consultations by those aged over 55 years, rising to 1% for those over 70 years.[8]

2.0 AIMS AND OBJECTIVES

2. AIM

To evaluate the effect of specific acupuncture points and local acupuncture points on osteoarthritis.

2.1 Objectives of the study

1. To assess the pain and stiffness and physical functions.
2. To assess range of motion (ROM)

3.0 REVIEW OF LITERATURE

3.1 OSTEOARTHRITIS

Osteoarthritis (OA) is a major public health problem among the elderly and is associated with considerable disability.[27] The knee is one of the most common body locations for OA. A recent analysis of data from the National Health and Nutrition Examination Survey III indicated that about 35 % of women and men aged 60 years and above had radiographic knee OA.[28.] OA is a complex chronic pain condition due in part to both nociceptive and neuropathic mechanisms.[29] Previous studies have demonstrated central sensitization in OA patients[30,31,32] and increased activity in the peri aqueductal grey (PAG) is associated with stimulation of the skin in referred pain areas of patients indicating a pathology change in the central nervous system of OA patients.[33]

Despite the high prevalence rate of OA, the treatment of OA is far from satisfactory pharmocological treatment of knee OA is often ineffective with unwanted and dangerous side effects.[34]

Arguably, acupuncture may be a promising treatment option for knee OA due to the effectiveness of the pain relief it provides[35,36,] and the rarity of adverse effects[37,38] Nevertheless, the mechanisms underlying the effects of acupuncture treatment in knee OA patients are still poorly understood. As a

unique treatment modality, studies have shown that acupuncture may produce an analgesic effect through the endogenous descending pain modulatory system.[39,40]

3.2 PREVALENCE

Osteo arthritis (OA) is one of the most prevalent condition resulting to disability particularly in elderly population. OA is the most common articular disease of the developed world and a leading cause of chronic disability, mostly as a consequence of the knee OA and or hip OA[9] pain and other symptoms of OA may have a profound effect on quality of life affecting both physical function and psychological parameters. knee OA is not a localized disease of cartilage alone ,but is considered as a chronic disease of the whole joint, including articular cartilage, meniscus, ligament and peri-articular muscle that may result from multiple patho physiological mechanism. It is painful and disabling disease that affects millions of patients.[10]

Knee OA is more important not only for its high prevalence rate compared with other types of OA, but also for its presentation at earlier age groups particularly in younger age groups of obese women.

The incidence of knee OA increase by age and further increase with longer lifetime and higher average weight of the population.[11] About 13% of women and 10% of men aged 60 years and older have symptomatic knee OA,

the proportions of people affected with symptomatic knee OA is likely to increase due to the aging of the population and the rate of obesity or overweight in the general population.[12]

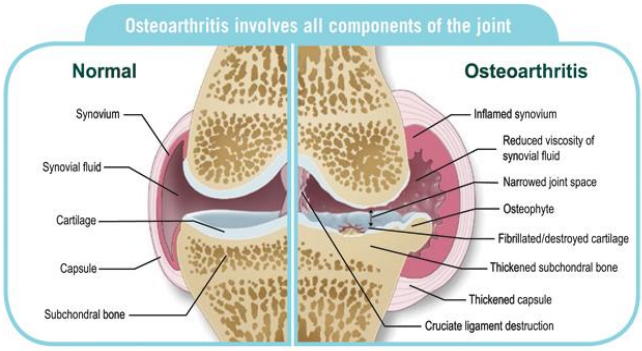
Prevalence of knee OA in men is lower compared with women. This was shown in a meta analysis of males and females in which the incidence of knee OA in males aged less than 55 years, intended to have more severe OA in the knee but not in the other sites the results of this study demonstrated sex differences incidence of knee OA particularly after menopausal age.

The prevalence of moderate to severe knee osteoarthritis changed from 3.7 % at the baseline assessment to 26.7% in the follow up visit .middle aged women had a high prevalence of moderate to severe knee osteoarthritis. The prevalence rates of knee OA vary according to study population as well as the methods applied for diagnosis.[13] The prevalence of radiographic knee OA has been investigated in Japanese people aged 60 years.

There was a high prevalence of radiographic knee OA. The pain in the knee was age –dependent in women, but not in men.[14] Osteoarthritis (OA), a rheumatic disease characterized by insufficiency of articular cartilage, presents pain and rigidity in joints as the main clinical manifestations (Fig. 1). Despite the difficulty in measuring, some studies aim to assess the influence of meteorological changes in OA patients, based on their frequent affirmation that conditions related to the weather modify the pain intensity. A study of

patients with rheumatic diseases showed that between one and two thirds of this patients believed that their symptoms were sensitive to meteorological elements.[15]

Figure 1 : This figure shows the normal and osteoarthric knee



3.3 TYPES OF OSTEOARTHRITIS

There are two types of osteoarthritis:

- Primary
- Secondary

1.3.1 Primary Osteoarthritis

It is a chronic degenerative disease that is related to, but not caused by, aging. As a person ages, the water content of their cartilage decreases, thus weakening it and making it less resilient and more susceptible to degradation.

There are strong indications that genetic inheritance is a factor, as up to 60% of all OA cases are thought to result from genetic factors.

1.3.2 Secondary Arthritis

Tends to show up earlier in life, often due to a specific cause such as an injury, a job that requires kneeling or squatting for extended amounts of time, diabetes, or obesity, but though the etiology is different than that of primary OA, the resulting symptoms and pathology are the same. The main symptoms are pain, loss of ability, and joint stiffness after exercise or use.

The main symptoms are pain, loss of ability, and “joint stiffness after exercise or use. These symptoms are often aggravated by activity or rigorous exercise and relieved during rest, though the disease may eventually progress to the point where the patient even feels pain when resting, and some people report pain so intense that it wakes them up when they are sleeping.

Osteoarthritis, at present, cannot be cured, and will likely get worse over time, but the symptoms can be controlled. Treatments vary widely, from alternative medicine, to lifestyle changes such as exercise and diet, to physical aids such as canes or braces, to medications such as acetaminophen, non steroidal anti-inflammatory drugs (NSAIDS), corticosteroids, and more.

Another principal aspect of osteoarthritis care that requires further research is diagnostic techniques. The current methods of clinical diagnosis and X-rays are not precise enough to effectively measure status and progression of the condition, which presents serious difficulties in evaluating both the impact of risk factors and the effectiveness of potential therapies. The lack of valid biomarkers limits pharmaceutical development and clinical monitoring.

The issues presented by the lack of both reliable diagnostics and medicines that can reverse the progression of osteoarthritis must be addressed through further research in order to effectively reduce the large health and economic burden of osteoarthritis.

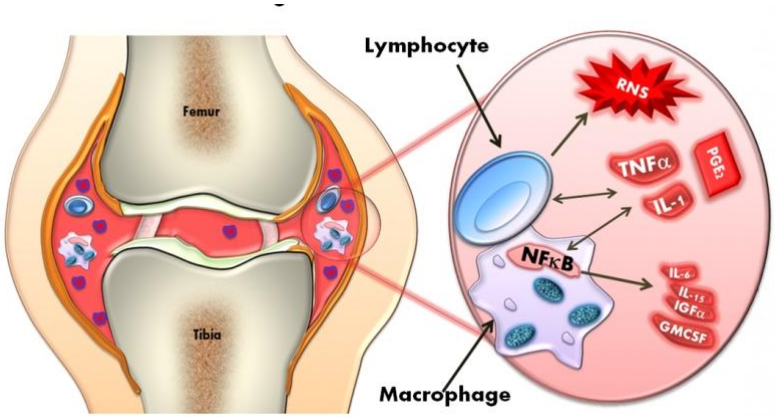
Figure 2 : Etiology of Osteo Arthrits

1.3.3 Pathogenesis

Modern imaging approaches recognize that OA is a whole joint disease which may involve multiple tissues which confer different phenotypes; sub chondral bone in particular is integral to the pathogenesis and progression of OA. In particular, the area of sub chondral bone at the femoro tibial articulation is larger in OA knees than healthy controls and correlates with knee joint space narrowing, osteophytes.[16]

Pathogenetically, knee OA is characterized by structural changes in and around the knee joint. The predominant structural changes are the loss of cartilage and the formation of osteophytes. These changes are easily demonstrated radio graphically, and objective measures of disease severity are based on the amount of joint space loss (a reflection of cartilage loss) and the presence of osteophytes.[17]

Figure 3 : Image showing the pathogenesis of OA knee.



Furthermore, the subchondral bone scleroses in the early phases of OA and this process, possibly involving micro fractures has been suggested to be pathogenetic factors in the process of cartilage degeneration.[18] In addition to these structural “hard tissue” changes, a number of changes in articular and peri- articular soft-tissue occur with knee OA. These include synovial hyperplasia[19] and joint effusions.[20]

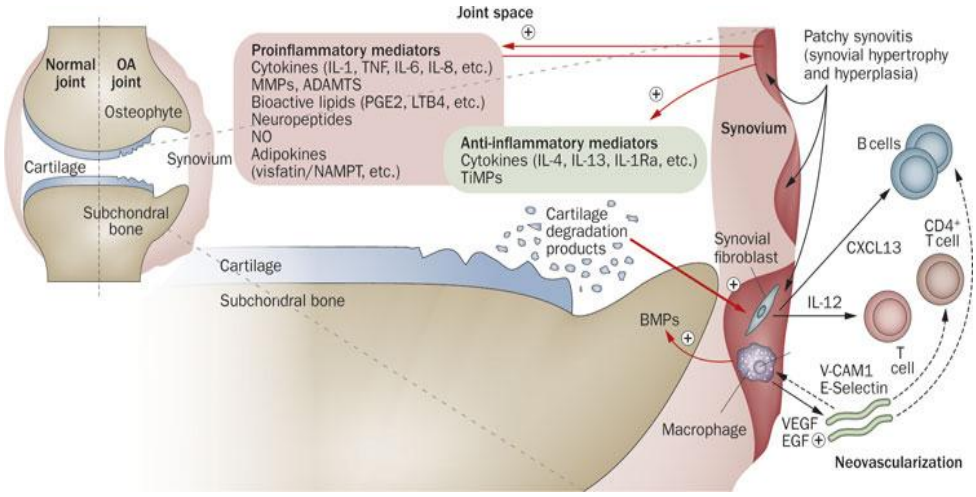
Although knee OA is not classified as an inflammatory disease, a common sign of knee OA is synovial inflammation, detected using Ultrasonography. In addition magnetic resonance imaging as well as orthoscopical inspection of the knee joint has also provided insights to the presence of inflammation in knee OA.[21]

1.3.4 Pathophysiology

OA is viewed as a metabolically active, dynamic process, including both cartilage destruction and repair. These processes may be initiated by several biochemical and mechanical insults.[22,23] The first OA change occurring in articular cartilage include a decrease in the superficial proteoglycan content, deterioration of superficial collagen fibrils, and an increase in the water content. The loss of proteoglycans and collagen results in diminished cartilage stiffnes[24] Subsequently, the chondrocytes increase the synthesis of cartilage matrix proteins, the destruction of components in the extracellular matrix accelerates, and the thickness of cartilage may even

increase. At the same time, calcified cartilage and subchondral bone become thicker in a response to the increased formation and resorption of the subchondral bone.[25]

Figure 4 : Image describes the pathophysiology of OA Knee Joint.



Ultimately, the concentration of proteoglycans decreases and collagen fibrillation declines due to diminished repair capabilities of chondrocytes. This process leads to splits of the cartilage extending down to bone. The degenerated cartilage with the disrupted collagen network cannot regenerate, and this pushes the OA tissue to the point of no return.

According to this theory, subsequent remodeling increases the stiffness and thickness of the subchondral bone in an attempt to dampen impact forces. As a consequence, the overlying cartilage may become overloaded and break down resulting in cartilage degeneration and loss.[26]

3.4 MUSCLES OF KNEE

3.4.1 flexion and Extension

- **Muscles of the Knee**
    - Quadriceps Muscles
        - Responsible for knee extension
- **Hamstring muscles**
    - Responsible for Knee Flexion
- **Calf** Muscles
    - Assist in Knee flexion
- Other Muscles that act at the knee
    - Sartorius
    - Popliteus
    - Plantaris
    - Gracilis

3.4.2 Movements of the Knee Joint

- The Sole extensor of the knee is the quadriceps femories.

- The hamstring muscles flex the knee, and are antagonists to the quadriceps femoris.

Figure 5 : Muscles Responsible for movements of Knee Joints.

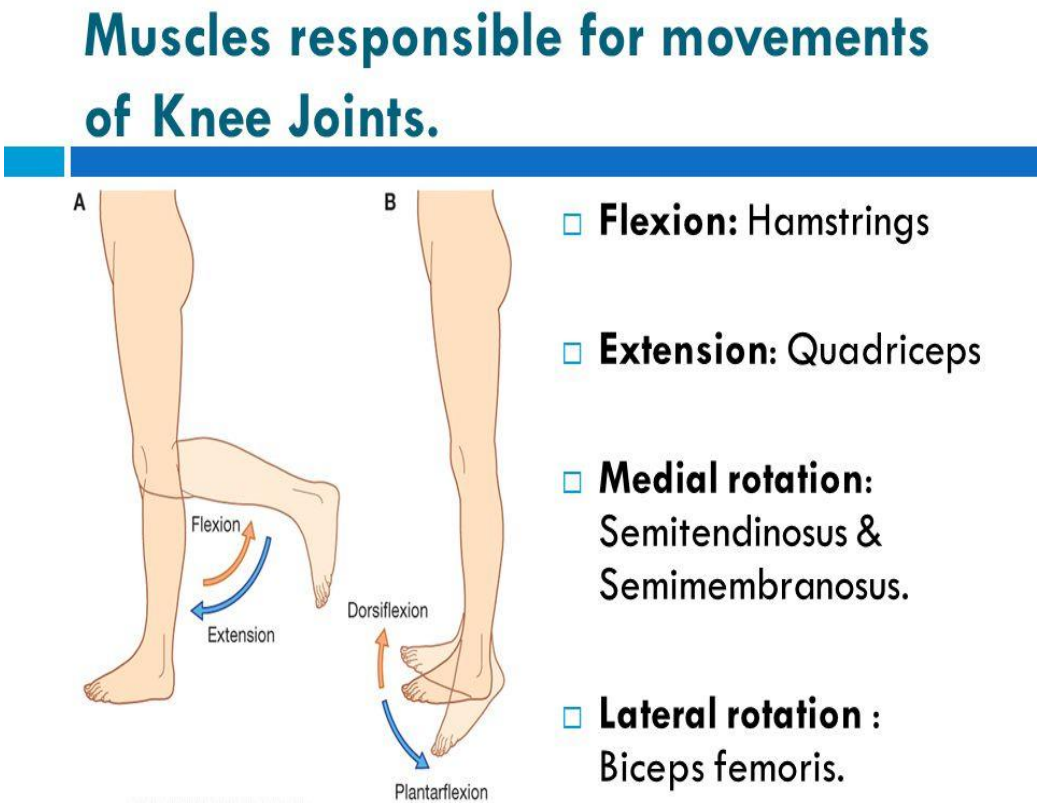


Figure 6 : Knee Flexion

Knee Flexion

ANATOMY:

- *Prim mover /agonist:*

Hamstring muscles Biceps femoris, Semitendinosus, and Semimembranosus

- *Synergist / Accessory Muscles:*

Gracilis, TFL, Sartorius, Poplieus, Gastrocnemius, &Plantaris.

Range of motion: *O to 135*

Substitution:

- hip flexors.
- Sartorius
- Gracilis

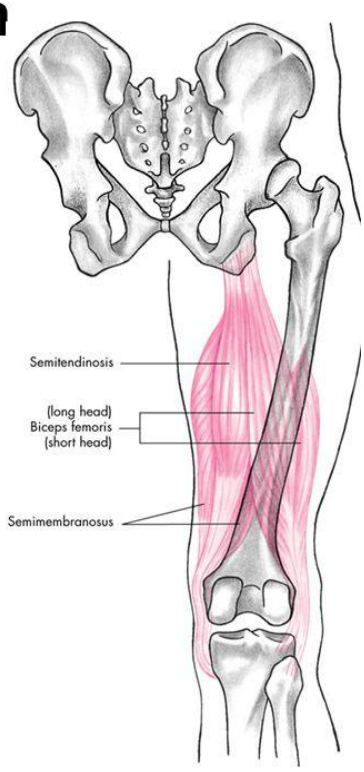
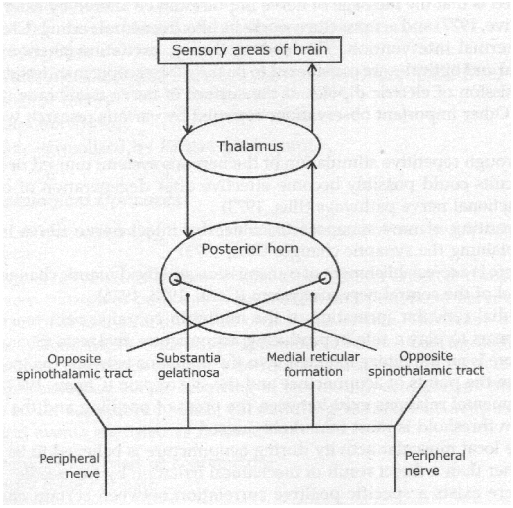
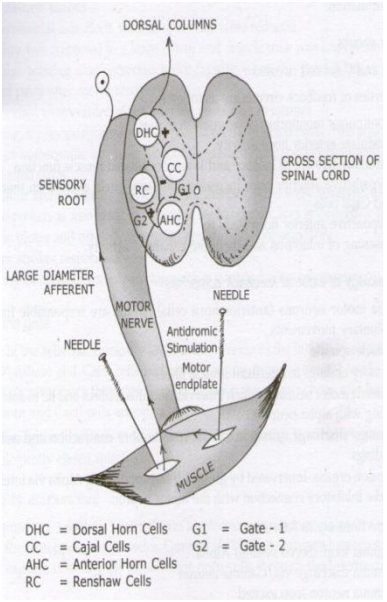


Figure 7 : Knee Acupuncture

Anatomically, acupuncture points have been corresponde to cutaneous areas of high electrical conductivity and distinct histologic differences compared with adjacent tissue. There are many theories that explain how acupuncture works. Gate Control Theory of Pain This theory postulates that specific nerve fibers transmit a pain signal to the brain via the spinal cord, and input of other nerve fibers can inhibit the pain transmission. Acupuncture is thought to stimulate inhibitory nerve fibers for a short period, thus reducing transmission of the pain signal to the brain.

Figure 8 : Pain pathway and mechanism.





3.5 MODERN ACUPUNCTURE

Modern acupuncture needles are thin and flexible and are made of solid surgical stainless steel. Unlike hypodermic needles, acupuncture needles are finely tapered, allowing them to slide smoothly into the skin. Certain acupuncture needles are thinner than the average strand of human hair. Along with herbalism, massage, and other therapies, acupuncture is one of the principle components of a 2000 year old system known as Traditional Chinese Medicine (TCM).

In the past two decades, TCM has grown in popularity in the United States. With that I find it to be important to research important underlying theories in Chinese medicine: the yin and yang and chi. More specifically, how the concept of the yin and yang and the concept of chi are applied in traditional Chinese medicine of acupuncture.

The report from a Consensus Development Conference on Acupuncture held at the National Institutes of Health (NIH) in 1997 stated that acupuncture is being commonly practiced by thousands of physicians, dentists, acupuncturists, and other practitioners for relief or prevention of pain and for various other health conditions (Culliton, 1997).

According to the 2002 National Health Interview Survey the largest and most comprehensive survey of Complimentary Alternative Medicine

(CAM) use by American adults to date, an estimated 8.2 million U.S. adults had used acupuncture, and an estimated 2.1 million U.S. adults had used acupuncture in the previous year (Barnes, 2002).

Figure 9 : Yin-Yang Theory

The yin-yang symbol is probably one of the most recognized Taoist symbols. Taoism, is considered to be a Chinese religious or philosophical way of life.

The yin-yang emblem can be found from common tattoos, martial arts, the new age movement, health, healing. The concept of the yin and yang can be found within the depiction of the symbol itself. The yin and yang symbol is a perfect circle that is divided into two equal halves.

A wavy line divides the circle with one portion as black and the other as white. The white section (yang) has a black dot in the center and the black section (yin) has a white dot in the center.

This particular yin yang symbol is called the Pentagram and originated about 2900 B.C. It consists of combination of broken lines (yin) and straight lines (yang) surrounding a circle and its two divisions, making a perfect emblem of the balancing of the forces of the universe.

3.6 ACUPUNCTURE AND OSTEOARTHRITIS

The non-drug interventions include ongoing access to appropriate information lifestyle measures (e.g.acupuncture, weight loss, exercise) acupressure, walking aids, wedged insoles, local therapy involving heat or cold, physiotherapy; transcutaneous electrical nerve stimulation (TENS) and food supplements.

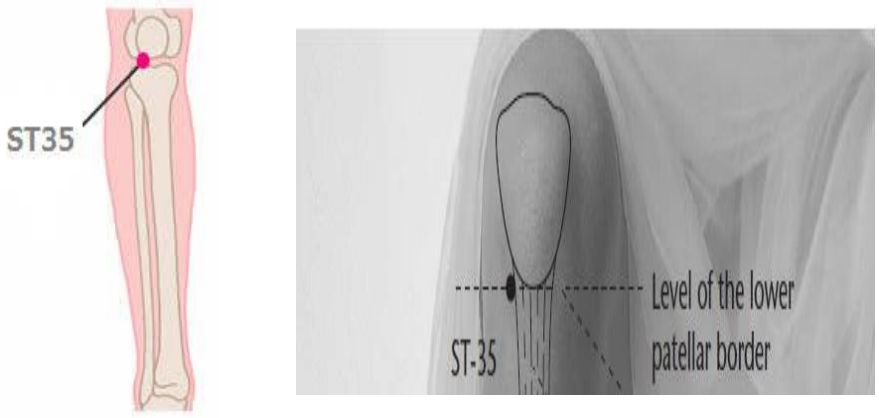
The current issues around decision-making and referral thresholds for surgery, and includes new recommendations about diagnosis and follow-up. The update also contains recommendations based on new evidence about the use of acupuncture in the management of osteoarthritis.

In general, acupuncture is believed to stimulate the nervous system and cause the release of neuro chemical messenger molecules. The resulting biochemical changes influence the body's homeostatic mechanisms, thus promoting physical and emotional well-being. Stimulation of certain acupuncture points has been shown to affect areas of the brain that are known to reduce sensitivity to pain and stress.

3.7 LOCAL ACUPUNCTURE GROUP POINTS

This group has the intervention points as ST-35(DUBI), SP-9 (YINLINGQUAN) EX-31(HEDING).

Figure 10 : ST-35 chinese name (DUBI)

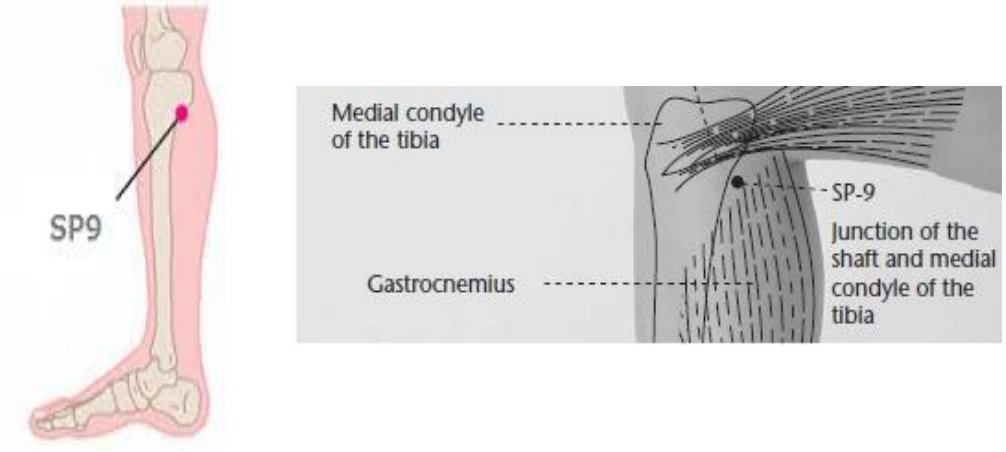


Location : Below the patella lateral to the patellar ligamentum. It is best located with the knee flexed in the depression over the lateral foramen of the patella (center of the lateral knee eye).

Indications : Arthritis and other diseases of the knee joint weakness of the leg muscles.

Needling : 0.5 to 1t-sun, straight or slanting towards medial foramen of the patella xiyan.

Figure 11 : SP-9 Chinese name (YINLINGQUAN):

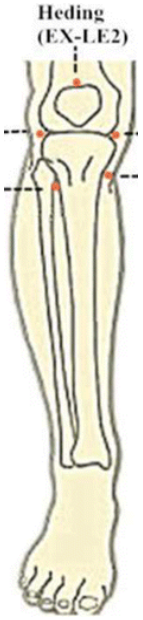


Location : In the groove of the lower border of the medial condyle of the tibia in a level with the lower border of the tuberosity of the tibia, same level of Yanglingquan(GB-34).

Indication : used in the arthritis of the knee as a local point.

Needling : 1.5 to 2 t-sun straight.

Figure 12 : EX-31:Chinese name (HEDING)



Location : On the mid point of the upper border of the patella.

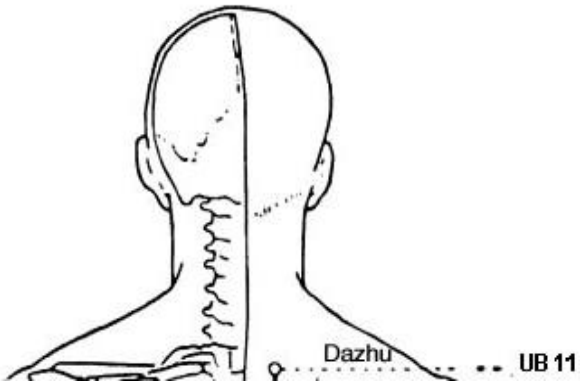
Indication : Diseases of the knee joint, weakness of the lower limbs.

Needling : 0.5 to 1 t-sun, straight.

All the points acts as a local acupuncture group, given for 14 days as pre assessment and post assessment for immediate effect and with Goniometer the degree of flexion and extension was measured.

3.8 SPECIFIC ACUPUNCTURE POINT GROUP

Figure 13 : UB-11(Dashu): Chinese Name



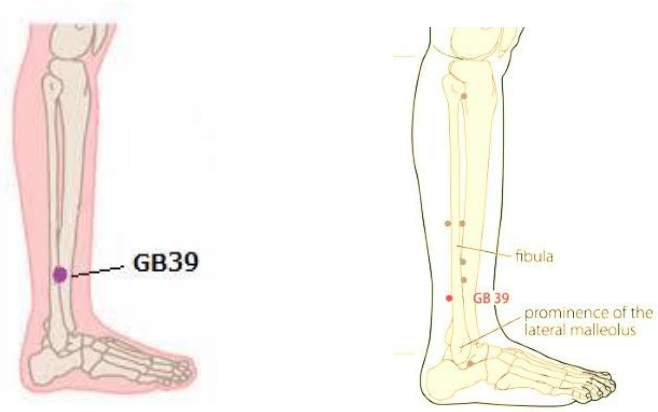
Location : on the back of the chest,1.5 t-sun lateral to the tip of the spinous process of the 1st thoracic vertebra.

Pecularity : It is an influential point for the bone and arthritis,

Indication : Tuberculosis of the bone arthritis and numbness of the limbs.

Needling : 0.5 to 1 t-sun straight.

Figure 14 : GB-39 (XUANZHONG) Chinese name.



Location : 3 t-sun above the lateral malleolus in the depression between the posterior border of the fibula and the tendon of peronaeus longus and brevis muscle.

Peculiarities : It is an influential point for bone marrow.

Indications : spondylosis, poliomyelitis and strengthening of bones and joints.

Needling : 0.5 to 1 t-sun straight.

This specific acupuncture point group was given needling for 14 days pre and post measurements for degree of flexion and extension was taken as

immediate effect to record the range of movement of knee in osteoarthritis patients recruited for this study.

The natural history of knee osteoarthritis is poorly understood. Osteoarthritis symptoms can vary greatly among patients. Symptoms include joint pain and stiffness, swelling, decreased function, and cracking or grinding noise with joint movement. Pain features are the pain itself, including its intensity, quality, and predictability as well as the pain's impact on mobility, mood, and sleep. Symptoms usually start gradually in a prolonged history of discomfort associated with exacerbation. Symptoms are often variable in severity and change slowly. Some patients may indicate that pain and functional disability increased over time and have symptoms that may progress from occurring during weight-bearing activities towards symptoms at rest, especially at night.[41]

3.9 PHYSICAL EXAMINATION

On physical examination, findings indicative of knee osteoarthritis include crepitus, painful and/or restricted movement, bony enlargement and absent or modest effusion. Other features may include deformity, instability, peri articular or joint-line tenderness and pain on patella femoral compression adopting pain-relieving postures and refrain from painful activity may be in part a conscious effort but also reflects the effect of joint afferents

on motor reflexes. Inhibition of quadriceps muscle may result from reduced capacity of the muscle to contract due to pain and swelling. Deficits in control of knee stabilizing muscles demonstrated in delay in activation occur as a result of pain.

3.10 ORIGIN

Acupuncture is generally held to, being have originated in China first mentioned in documents dating from a few hundred years leading up to the Common Era. Sharpened stones and bones that date from about 6000 BCE have been interpreted as instruments for acupuncture treatment.[42]

The first document that unequivocally described an organized system of diagnosis and treatment which is recognized as acupuncture is The Yellow Emperor's Classic of Internal Medicine, dating from about 100 BCE. The information is presented in the form of questions by the Emperor and learned replies from his minister, Chhi-Po. The text is likely to be a compilation of traditions handed down over centuries, presented in terms of the prevailing Taoist philosophy, and is still cited in support of particular therapeutic techniques. The concepts of channels (meridians or conduits [3]) in which the Qi (vital energy or life force) flowed are well established.[43,44,45]

3.11 ACUPUNCTURE IN MEDICAL PRACTICE

The first medical description of acupuncture by a European physician was by Ten Rhijne, in about 1680, who worked for the East India Company and witnessed acupuncture practice in Japan[46]

Then, in the first half of the nineteenth century, there was a flurry of interest in both America and Britain, and a number of publications appeared in the scientific literature including a Lancet editorial article entitled 'Acupuncturation[47].

By mid-century, acupuncture had fallen into disrepute and interest lay dormant, though it was briefly resurrected in one edition of Osler's textbook in which he describes dramatic success in the treatment of back pain with hat-pins[48]. Interestingly, this comment was deleted from subsequent issues.[49]

The spread of acupuncture to other countries occurred at various times and by different routes. In the sixth century, Korea and Japan assimilated Chinese acupuncture and herbs into their medical systems.[50].

Table 1 : Non-pharmacologic recommendations
Alternative and complementary modalities

Organization	Acupuncture	TaiChi	Thermal modalities	TENS (if not surgical candidate)	Therapeutic ultrasound
ACR (knee)	CR	CR	CR	CR	
EULAR-knee B	B			B	C

Osteoarthritis is the single most common cause of disability in older adults. It ranks as the fifth highest cause of years lost to disability in the whole population in high-income countries, and the ninth highest cause in low- and middle-income countries. It accounts for 50% of the entire musculoskeletal disease burden, and thus is considered the highest-burden condition within the musculoskeletal group of diseases, which also includes rheumatoid arthritis and osteoporosis. Radiographic evidence of knee osteoarthritis is present in approximately 30% of men and women over the age of 65.Worldwide estimates are that 9.6% of men and 18.0% of women over the age of 60 years have symptomatic osteoarthritis. Approximately 80% of those with OA will have limitations in movement, and 25% cannot perform their major activities of daily life.

Strusberg et al 2002. In a study with a healthy control group, assessed pain reports during 12 months using VAS and Like verbal scale in OA, RA, and fibromyalgia (FM) patients diagnosed by the American College of Rheumatology (ACR) criteria. Among these pain[51] reports recorded, 37.94% were OA patients correlated to low temperature and high humidity.

Vergés et al. 2004 study with OA, RA, and control group patients to assess articular pain, used VAS and included functional capacity assessment using the Health Assessment Questionnaire (HAQ).[52]

Wilder et al. 2003.When assessing the influence of meteorological factors in pain, registering its intensity by OA affected region observed that, among the assessed associations, hand OA presented greater intensity of pain during high atmospheric pressure, with statistical significance, while in other days with constant or falling atmospheric pressure, no influence in articular pain intensity was observed.[53]

McAlindon et al. 2007 More recently, to determine if meteorological parameters influenced in OA knee arthralgia rated by the ACR criteria.[54] McAlindon et al.2007 performed a longitudinal analysis involving 200 participants.[54]

Strusberg et al.2002. 13. In South America, in Cordoba (Argentina), the results of Strusberg et al. supported the belief in the influence of meteorological factors in rheumatic pain, but with different intensity and with the meteorological variables influencing more or less, according to the diagnosis.[55]

Litwic A et al. 2013, Had told about the physical burden of the joints in osteoarthritis. Epidemiology and burden of osteoarthritis.[56]

Adam C et al. 1998, The distribution of cartilage thickness in the knee-joints of old-aged individuals -- measurement by A-mode ultrasound. Clinical examination.[57]

Nguyen US et al. 2011 has done the survey of the symptoms of knee osteoarthritis. . Increasing prevalence of knee pain and symptomatic knee osteoarthritis: providing the data collection.[58]

Losina E et al. 2013 explained about the risk of osteoarthritis as lifetime diagnosed as symptomatic changes in life risk.[59]

MacKay C et al. 2014. A qualitative study of the consequences of knee symptoms, told about the normal neuro muscular activity in normal person knee and sports persons activities.[60]

Tsai CC et al. 2014, Structural changes in the herbal drug guiluerxian jiao on muscle strength, articular pain, and disability in elderly men with knee osteoarthritis. Evidence Based Complementary and Alternative therapy and its need nowadays.[61]

Neil A Segal et al. 2009, study observed the changes in the symptomatic in bone and muscular part that extends in nature.[62]

Lewis et al. The Effect of Thigh Strength on Incident Radiographic and Symptomatic Knee Osteoarthritis in the Multicenter Osteoarthritis (MOST) Study.[63]

3.12 RADIOLOGICAL FINDINGS

The plain radiograph serves as the primary investigation in the diagnosis of knee OA, as well as in assessing the severity of the disease. The advantages of radiography are evident: it is cost-effective and relatively safe and its availability is excellent. However, the subjective pain and radiographic changes do not necessarily correlate with each other.

Typical radiographic features in knee OA include joint space narrowing, osteophytes, subchondral bone sclerosis, cyst formation, osteochondral bodies and bone deformity. Loss of cartilage is an early and cardinal feature of OA leading to joint space narrowing in plain radiographs.

The thickness of articular cartilage varies between individuals and joint surfaces. Therefore, no reference values for thickness of joint space exist. The osteophytes are a hallmark of OA, these being formed at joint margins by endochondral ossification.

They can be regarded as a repair attempt and indicate redistribution of abnormal joint loading. Cysts are also typical radiographic findings in OA and occur mainly within the areas of bony sclerosis at sites of increased pressure transmission. Disintegration of the joint surface in OA results in the formation of Osteochondral fragments. As these fragments are released into the joint space, they appear characteristically with the other established features of OA.

3.13 ELECTROTHERAPY

Transcutaneous electrical nerve stimulation (TENS) is recommended in most guideline as safe adjunctive modalities for pain relief. Although, acupuncture may provide relief to some patients, there is less universal support for its use.[64]

3.14 SURGICAL APPROACH IN OSTEOARTHRITIS KNEE

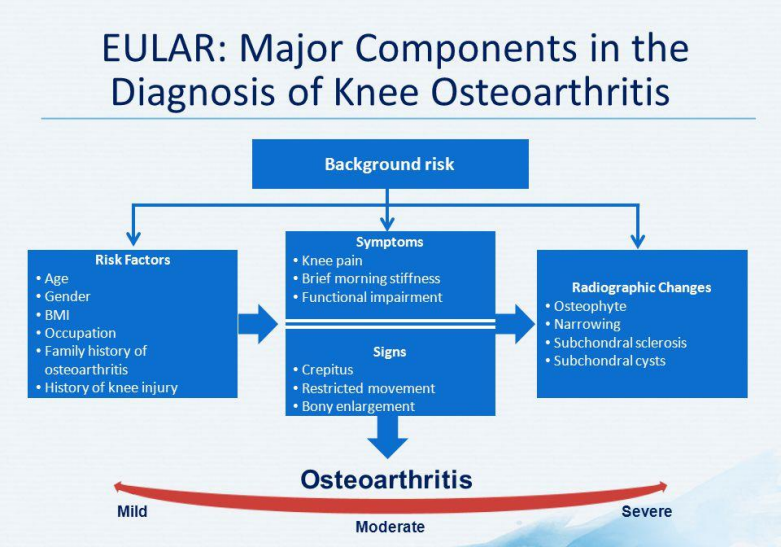
Joint replacement surgery should be considered in patients who experience persistent pain and reduced function that are refractory to non-surgical therapies, and which impact markedly on their quality of life. Total or partial joint arthroplasty surgeries are highly invasive procedures, requiring surgical resection of all or parts of the joint and insertion of prosthesis. Many patients who undergo total knee arthroplasty (TKA) experience improved function and decreased symptoms, many others continue to have some degree of ongoing pain.

3.15 ALTERNATIVE THERAPY RECOMMENDATION

Alternative and complementary therapies were also somewhat controversial (Table5). Acupuncture, specifically for knee OA, was strongly not recommended by the AAOS65 but was recommended by other groups. Taichi was recommended by the ACR66 and the Asian consortium but was

not addressed in other guidelines. Thermal modalities were recom mended by the ACR, OARSI67 NCC-CC [21], and EULAR.

Figure 15 : Major Components in the Diagnosis of Knee Osteorthritis



(for hand. Transcutaneous electrical nerve stimulation (TENS) was recommended by some, primarily for patients who were not surgical candidates[68].

3.16 TRADITIONAL CHINESE MEDICINE

Acupuncture is generally held to have originated in China, being first mentioned in documents dating from a few hundred years leading up to the Common Era. Sharpened stones and bones that date from about 6000 BCE have been interpreted as instruments for acupuncture treatment[69,70] but they

may simply have been used as surgical instruments for drawing blood or lancing abscesses[71].

Documents discovered in the Ma-Wang-Dui tomb in China, which was sealed in 198 BCE, contain no reference to acupuncture as such. These tattoos might indicate that a form of stimulatory treatment similar to acupuncture developed quite independently of China. The first document that unequivocally described an organized system of diagnosis and treatment which is recognized as acupuncture is The Yellow Emperor's Classic of Internal Medicine, dating from about 100 BCE. The information is presented in the form of questions by the Emperor and learned replies from his minister, Chhi-Po[72]

The text is likely to be a compilation of traditions handed down over centuries. The concepts of channels (meridians or conduits) in which the Qi (vital energy or life force) flowed are well established by this time, though the precise anatomical locations of acupuncture points developed later[73].

Acupuncture continued to be developed and codified in texts over the subsequent centuries and gradually became one of the standard therapies used in China, alongside herbs, massage, diet and moxibustion (heat). Many different esoteric theories of diagnosis and treatment emerged, sometimes even contradictory possibly as competing schools attempted to establish their exclusiveness and influence. Bronze statues from the fifteenth century show

the acupuncture points in use today, and were used for teaching and examination purposes. During the Ming Dynasty (1368–1644).

The knowledge and skill were retained, however, either as an interest among academics or in everyday use by rural healers. With China's increasing acceptance of Western medicine at the start of the twentieth century, final ignominy for acupuncture arrived in 1929 when it was outlawed, along with other forms of traditional medicine.

After the installation of the Communist government in 1949, traditional forms of medicine including acupuncture were reinstated, Chairman Mao is quoted as saying, in relation to traditional medicine, 'Let a thousand flowers flourish' although he himself rejected acupuncture treatment when he was ill. The divergent strands of acupuncture theory and practice were brought together in a consensus known as traditional Chinese medicine (TCM) which also included herbal medicine.

Acupuncture research institutes were established in the 1950s throughout China and treatment became available in separate acupuncture departments within Western-style hospitals. Over the same period, a more scientific explanation of acupuncture was sought by Prof. Han in Beijing who undertook ground-breaking research on acupuncture's release of neurotransmitters, particularly opioid peptides[74]

The spread of acupuncture to other countries occurred at various times and by different routes. In the sixth century, Korea and Japan assimilated Chinese acupuncture and herbs into their medical systems. Both countries still retain these therapies, mostly in parallel with Western medicine. Acupuncture arrived in Vietnam when commercial routes opened up between the eighth and tenth centuries.

In the West, France adopted acupuncture rather sooner than other countries, Jesuit missionaries first brought back reports of acupuncture in the sixteenth century, and the practice was embraced by French clinicians fairly widely. Berlioz, father of the composer, ran clinical trials on acupuncture and wrote a text in 1816.[75]

The first medical description of acupuncture by a European physician was by Ten Rhijne, in about 1680, who worked for the East India Company and witnessed acupuncture practice in Japan. Then, in the first half of the nineteenth century, there was a flurry of interest in both America and Britain, and a number of publications appeared in the scientific literature including a Lancet editorial article entitled ‘Acupuncturation’[76].

By mid-century, acupuncture had fallen into disrepute and interest lay dormant, though it was briefly resurrected in one edition of Osler’s textbook in which he describes dramatic success in the treatment of back pain with hat-pins[77]

Interestingly, this comment was deleted from subsequent issues In 1971, a member of the US press corps was given acupuncture during recovery from an emergency appendectomy in China, which he was visiting in preparation for President Nixon's visit. He described the experience in the New York Times[78] and subsequently teams of US physicians made fact-finding tours of China to assess acupuncture, particularly its use for surgical analgesia[79] Despite initial excitement at the operations they witnessed, acupuncture proved to be utterly unreliable as an analgesic for surgery in the West. Acupuncture finally reached its present level of acceptability in the USA when an NIH consensus conference reported that there was positive evidence for its effectiveness, at least in a limited range of conditions[80] the last decade of the twentieth century systematic reviews have provided more reliable evidence of acupuncture's value in treating knee pain, dental pain, back pain and headache[81]

B**rinkhaus.**et.al 2007.Physician Treatment characteristics in a rct of acupuncture with osteoarthritis knee noted that 15% of trial physicians would have applied acupuncture differently outside of the study.greater improvements in painand joint function than those in the minimal acupuncture or waiting list control groups at 8 weeks.[82]

Marlene fransen,et, al 2011.In epidemiology of osteoarthritis in asia, morbidity associated with knee OA, some of the copcord studies related quality of life, evaluations of physical disability.[83]

Phua HP, Chua AV, et, al, 2009.In Singapore musculoskeletal conditions are listed as the fifth leading cause of morbidity in 2014.accounting for 4.9% of years lost to disability (YLD).[84]

George T. Lewith et, al, 2006. Developing a Research Strategy for Acupuncture in analyzing on road study conducted in japan[85],demonstrated occupations involving squatting or kneeling more than 2 hours per day were associated with an approximately severe pain, conducted as cohort study aged 60years older in heizing.[86]

Ng mml,et, al study explains about the effects of electro acupuncture and transcutaneous electrical nerve stimulation on patients with painful osteoarthritis of knee. stomach 35 acupuncture point location stimulation[87] conducted a study with control single blinded randomized controlled trail, on 24 patients on electrical stimulation with control standard therapy got the effect of reduction of pain in the osteoarthritis of knee.

4.0 MATERIALS AND METHODS

4.1 SUBJECTS

A total of 60 subjects of both gender with ages ranging between 50 – 70 years participated in the study.

4.1.1 Description of the subjects including the selection of samples

The study subjects were selectively recruited from the government yoga and naturopathy medical college & Hospital, Chennai. State of Tamilnadu in India. From the outpatient department and inpatient department. The Subjects were recruited from the above mentioned hospital through screening done to assess diagnostic criteria, inclusion and exclusion criteria. Sixty participants were screened through the medical checkup along with the previous reports included x-ray and scan diagnostics which is done already and those satisfying the Diagnostic criteria for Osteoarthritis of knee were recruited for the study. 30 for the local acupuncture points and 30 for the specific acupuncture points.

4.1.2 Demographics

Table No. 2 : Describes the demographic details of the Subjects.

	Local acu point Group	Specific acu point group
Age [Mean ± SD]	59.93(5.8)	59.90(6.64)
Gender distribution	13 Females,17 Males (n=30),	8 Females, 22 Males (n=30),
Total Participants completing the study	30	30
Ages range	50 – 70 years	

4.2 ETHICAL CONSIDERATIONS

4.2.1 Ethical Clearance

Ethical clearance was sought from the Institutional Ethics committee prior to the start of the study and the approval for the same was granted.

4.2.2 Written Informed Consent

Subjects were appraised about the purpose of the study and their rights on research subjects. Informed consent form was administered in Tamil and English, adequate time was given to each patient to go through the information sheet and their queries were answered.

Their right to withdraw anytime from the study and the need for willingness to participate voluntarily in the study was explained. All the

subjects expressed their willingness to participate in the study by giving a signed informed consent (A sample information sheet and consent form is enclosed as Annexure-1)

4.3 SCREENING OF SUBJECTS

4.3.1 Criteria for Diagnosis (WOMAC)

A new multidimensional, self-administered health status instrument for patients with osteoarthritis of the hip or knee. The pain, stiffness and physical function subscales fulfil conventional criteria for face, content and construct validity, reliability, responsiveness and relative efficiency. WOMAC is a disease-specific purpose built high performance instrument for evaluative research in osteoarthritis clinical trials. In the present study WOMAC questionnaire has been used to assess the degrees of pain, stiffness and physical function of knee of osteoarthritis patients.

4.3.2 Inclusion and Exclusion Criteria

4.3.2.1 Inclusion Criteria

The following inclusion criterion was adopted for recruiting the subjects.

1. Aged within 50 to 70 years with knee OA according to the American College of rheumatology criteria.
2. Pain in the knee in preceeding two weeks ≤ 3/10;
3. No prior treatment with acupuncture.
4. No intra articular injections in the knee in the previous 2 months.

4.3.2.2Exclusion Criteria

Participants would be excluded in the study if Inflammatory diseases, including rheumatoid arthritis; Cancer Traumatic injury that might be related to the current knee pain.

Autoimmune diseases Uncontrolled hypertension Diabetes mellitus requiring insulin injection

Life-threatening cardiovascular or neurological events within the past year. Chronic respiratory disease, Haemorhagic disease, Alcohol or drug addiction.

4.4 DESIGN

4.4.1 Type of the Design

A comparative clinical study

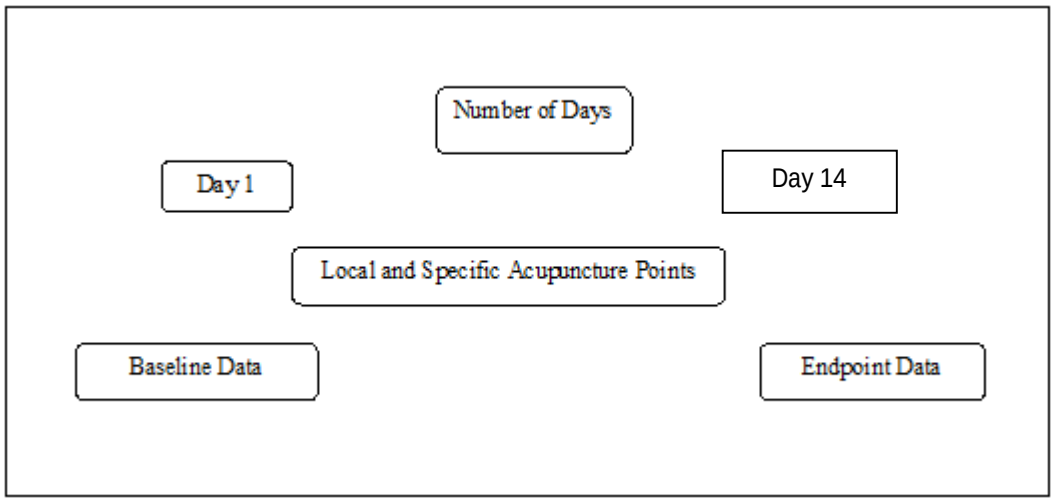
4.4.2 Allocation of Patients Into Study and Control Groups

The patients were allocated to Local acupuncture group and Specific acupuncture group. Type of intervention were prescribed seventy two subjects were initially screened and sixty of them were recruited (i.e) local acupuncture group (n=30) and specific acupuncture group (n=30).

4.4.3 Data Points

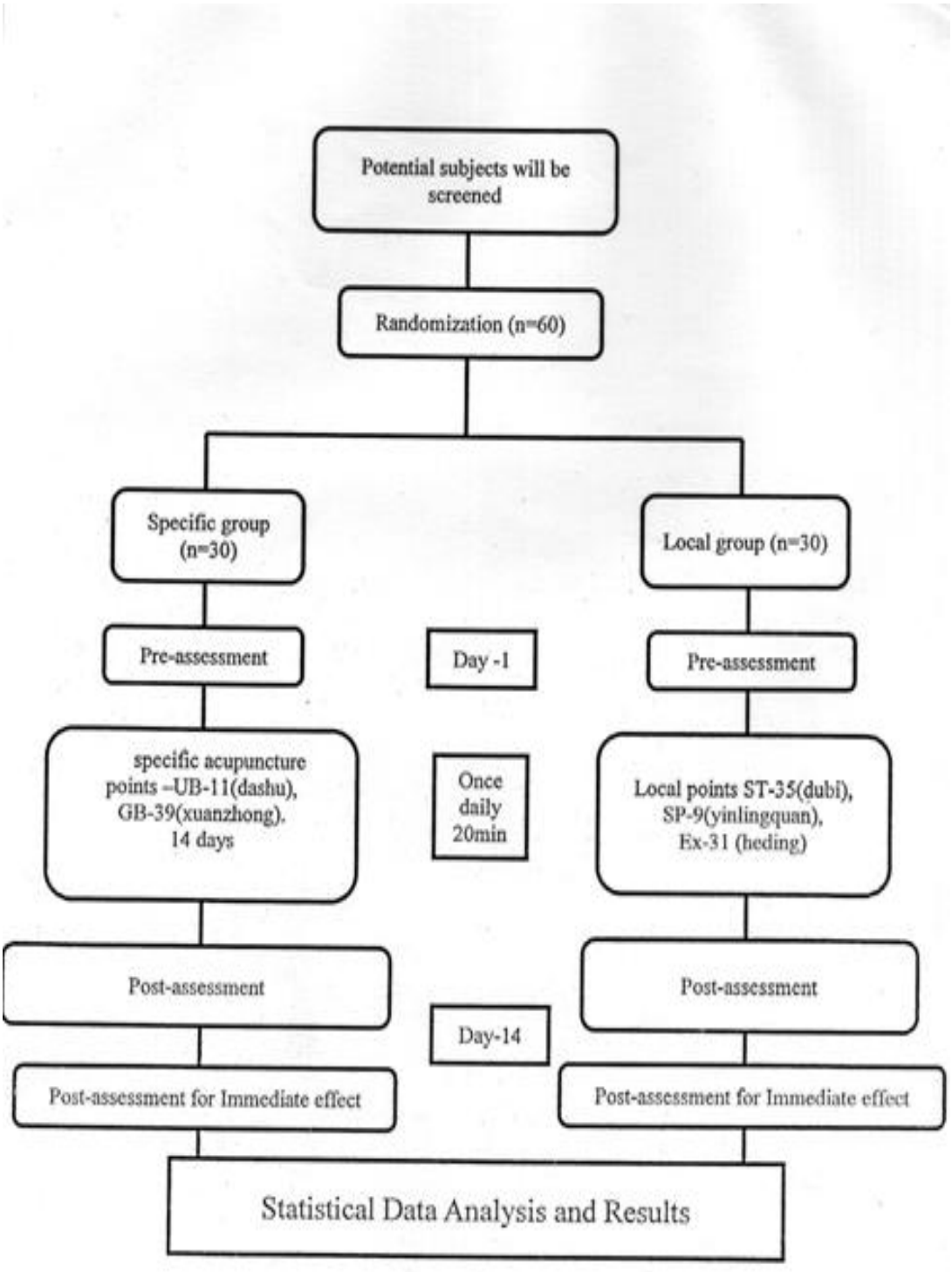
The data collection was done before and after the baseline data and intervention data points. The data collection was done before (day 1), and after (day 14) of the interventions. Immediate effect of the intervention was also taken at the last day(14).

Figure : 16



4.4.4 Trail Profile

Figure : 17



4.5 ASSESSMENTS

The baseline and post-intervention assessments consisted of :

1. WOMAC Questionaire
2. RANGE OF MOTION.

In both legs, measuring degree of flexion and extension. pain, stiffness and physical function related symptoms were scored, pre and post datas collected for assessment.

Table 3 : List of primary and secondary outcome variables

Primary outcome variable	**Secondary outcome variables**
WOMAC Questionaire to assess Pain Stiffness Physical Function	Range of Motion of the knee joints using Goniometer Degree of Flexion Degree of Extension in both the legs

4.5.1 Primary Outcome Variables

Western Ontario and McMasters Universities Osteoarthritis (WOMAC)

The WOMAC evaluates 3 dimensions: pain, stiffness, and physical function with 5, 2, and 17 questions, respectively. The Likert version of the WOMAC is rated on an ordinal scale of 0 to 4, with lower scores indicating lower levels of symptoms or physical disability. The questionnaire is self-administered and takes 5 to 10 minutes to complete. The WOMAC has been

translated into German, Swedish, and Hebrew; a computerized version is available.[88]

The WOMAC is intended to evaluate change in patient status following therapeutic intervention. Evaluation of therapeutic effectiveness relies on outcome measures that can accurately assess change. Specifically, the measure must be reliable[89] in order to ensure that true change is detected as opposed to measurement error. In addition, construct and known group validity and responsiveness must be demonstrated before the tool can be used with confidence in a particular patient population. Reliability, validity, and responsiveness must be demonstrated for each new patient group.[90]

This literature review summarizes the reliability, validity, and responsiveness of the WOMAC (subscales and globalscore) for the purpose of assisting clinicians and researchers in making decisions regarding the use of the WOMAC as an outcome measure.

Construct validity and responsiveness data were organized according to the joint being studied in each article (i.e. knee). The results was based on the intervention in the study and miscellaneous. The miscellaneous category interventions,can be administered (i.e) exercise, manual and physical therapy and knee braces, can be given to evaluate the womac scales.If it is needed.But not induced for this study.

Theiler R, et,al, 1999. study showed superior responsiveness after knee surgery of pain and function of WOMAC compared to Lequesene-algofunctional index with osteoarthritis of lower limbs.[91]

Griffths,et,al 1995.studied relative efficiency as a comparative study between WOMAC,AIMS AND HAQ instruments in evaluating the outcome of knee surgery.[92]

Heck DA,et,al 1998. explains patient outcome of pain, stiffness, physical function WOMAC scoring, after knee replacement surgery.[93]

SCHICK M,et,al 1999. Study shows quality of life after total replacement of knee.[94]

4.5.1.1Pain

This theory is based on the work of Ronald Melzack (1965) and wald (1972).they proposed the concept of functional gates through which all pain impulses pass.

Pain sensations originate mainly in two types of pain receptors: low-threshold nociceptors that are connected to fast conducting aδ-fibers, and high-threshold nociceptors that conduct impulses through slower unmyelinated C-fibers. Central terminals of these sensory fibers enter the central nervous system (CNS) through the dorsal horn of the spinal cord, where they connect with spinal neurons via synaptic transmission. Neurons of

superficial laminae I and deep laminae V project along the spinothalamic and spinoreticulothalamic tracts to supraspinal sites such as the thalamus, parabrachial nucleus, and amygdala, where pain signals are further processed and sent on to higher cortical centers.[96]

4.5.1.2Stiffness

Due to degeneration and impairment of neuro muscular, less physical activity, muscular contraction gains leads to stiffness.

H.ANTONY,et,al,1999. Study conducted ,Acupuncture on Carnitine Skeletal muscle disease are associated with contractures, cramps, muscle stiffness and deep muscle aching. These phenomena relate to skeletal muscle fatigue[96]

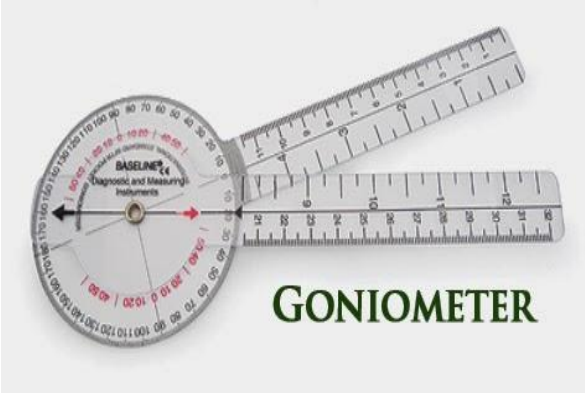
Toda has reported the effect of acupuncture on carnitine in skeletal muscle. how carnitine has responsible role in energy production and modulation of the intra mitochondrial coenzyme A ratio in the skeletal muscle.[97]Acupuncture has been useful therapy on muscle symptoms. Carnitine can directly improve the fatigue characteristics of muscles enriched in type I fiber.

4.5.1.3Physical Function

Daily routinue activites of human,affected due to symptoms of osteoarthritis, and performance of functional ability is measured and recorded by Womac questionnaire.

4.5.2 SECONDARY OUTCOME VARIABLES

Figure : 18 Goniometer



It is a instrument widely used to measure the angles, particularly the Range Of motion.measuring the limits,degrees of flexion and extension of the joints. A Calibrated protractor like device commonly with a180* range, is used to measure flexibility of musculoskeletal function, of various joints. In this study , this device have been used to record the measurements of physical function and muscle stiffness were assessed.

4.5.3 Range of Motion

4.5.3.1Definition of Range of Motion

Range of Motion is the measurement of movement around a specific joint or body part.

4.5.3.2Types of Range of Motion

There are three primary types of exercises specific to range of motion. **Passive range of motion** is typically practiced on a joint that is inactive. The physician may use this exercise on a client who is paralyzed or unable to mobilize a specific joint. This type of exercise can help prevent stiffness from occurring. During this exercise the patient does not perform any movement, while the therapist stretches the patient's soft tissues.

Active-assistive range of motion exercises are more progressive, intended for the patient to perform movement around the joint, with some manual assistance from the physician, or from a strap or band. These exercises can often feel painful, and the muscles can feel weak. Increasing range of motion with these exercises should be a gradual advancement.

Active range of motion exercises are highly independent, performed solely by the patient The physical therapist's role may be simply to provide verbal cues.

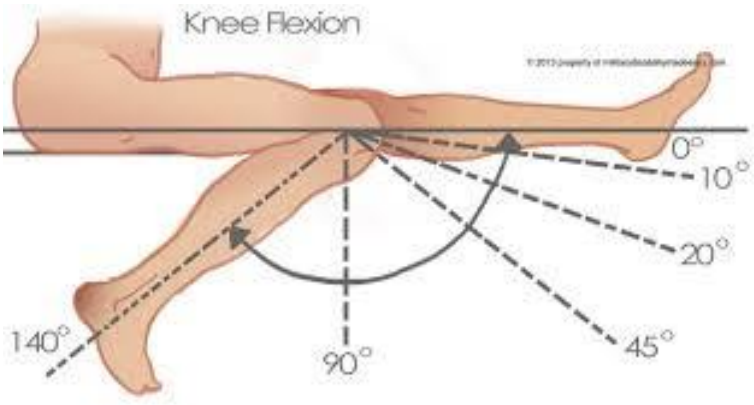
4.5.4 MEASUREMENTS

To measure range of motion, physicians most commonly use a **goniometer**, which is an instrument that measures angle at a joint. Goniometers show degrees of an angle from zero to 180 or 360 degrees and

are available in different shapes and sizes for the unique joints in the human body, when using a goniometer to measure knee flexion, the center of the tool will be at the side view of the knee joint, and the arms of the goniometer are aligned in the center of the long bones above and below the knee. As the knee is bent or flexed the movable arms provide a measure of the degree of movement. Other tools used to measure joint angle at extension and flexion are an **inclinometer**, which assists in measuring the spinal angle, or even a tape measure for various joints. In order to confirm that there is progress being made on increasing the range of motion in a joint, the physical therapist measures the joint angle prior to treatment, and continues to do so over time.

Normal ROM at the knee is considered to be 0 degrees of extension(completely straight knee joint) to 135 degrees of flexion(fully bent knee joint).Most functional activities require 0 to 120 degrees of motion at the knee. Common causes of decreased ROM include arthritis, knee surgery and knee injuries.

Figure 19 : Range of Motion



Maintaining strength and flexibility in the muscles that control knee motion is crucial.The hamstrings are the primary knee flexors,and the quadriceps are the primary knee extensors.

4.6 INTERVENTION

Acupuncture is a challenging system of medicine around the world. There are two common methods of acupuncture practiced around the world. One being the western acupuncture called the Clinical Acupuncture (CA), another being the TCM acupuncture. CA has local and specific points listed for various diseases or conditions whereas the TCM has many methods of diagnosis and the points are selected based on the individual pattern of the disease or condition.

4.6.1 Written Informed Consent

Subjects who fulfilled inclusion criteria were appraised about was sought from the Institutional Ethics Committee prior to the start of the study and the approval for the same was granted.

- Intervention
- Local Points
- Stomach-35(DUBI), spleen-9(YINLINGQUAN),EX-31(HEDING)
- Specific Points:
- Urinary bladder-11(DASHU),Gall Bladder-39(XUANZHONG).

Table 4 : Treatment Approach

Non-Pharmacological treatment	Pharmacological treatment
Education (patient and SYSADOA (Symptomatic Slow Acting Drugs for OA (avocado/ soybean unsaponifiables (ASU), chondroitin, diacerein and glucosamine)	Paracetamol / Acetaminophen
Topical NSAIDS spouse or family)	NSAIDS (Non-steroidal anti-inflammatory drugs) [plus misoprostol or a proton pump inhibitor]
Social support	COX-2 inhibitors (cyclo-oxygenase-2 selective non-steroidal anti-inflammatory drugs)
Physical therapy	Opioid analgesics
Occupational therapy	Psychotropic drugs
Weight loss	Topical capsaicin
Exercise	Intra-articular treatment : Corticosteroids
Orthotic devises	Hyaluronans
Pulsed EMF (Electromagnetic field therapy)	
Tidal irrigation	
Transcutaneous electrical nerve stimulation (TENS)	Surgical : Arthroscopy
Acupuncture	Osteomy
Herbal remedies	UKR (unicompartmental knee replacement), Total joint arthroplasty (knee or hip)

Table 5 : **Risk Factors**

Risk Factors for Incidence and Progression of Osteoarthritis	Notes
Age	Normal ageing processes cause increased OA progression Incidence increases with age but levels off around age 80
Trauma	Collateral ligament, meniscal tears and joint fractures lead to increased risk for OA
Occupation	Significant relationship between OA and occupational kneeling or repetitive use of joint during work Certain occupations, such as farming, construction work, physical education teaching, are risk factors for the development of OA
Exercise	High-impact sports present an increase for knee OA
Gender and ethnicity	Women over 50 have a higher prevalence and incidence of OA than men of the same age
Genetics	Children of parents with early onset OA are at a higher risk of developing OA themselves
Obesity	Strongest modifiable risk factor Overweight or obese people have almost 3 times the risk of developing OA as people with a normal weight (OR 2.96 [95% CI 2.56 to 3.43])
Bone density	Decreased bone mineral density is a risk factor for OA

Table 6 : Socio Economic Group

	Low- and middle-income countries				High-income countries		
	Cause	YLD (millions)	Per cent of total YLD		Cause	YLD (millions)	Per cent of total YLD
1	Unipolar depressive disorders	55.3	10.4	1	Unipolar depressive disorders	10.0	14.6
2	Refractive errors	25.0	4.7	2	Hearing loss, adult onset	4.2	6.2
3	Hearing loss, adult onset	23.2	4.4	3	Alcohol use disorders	3.9	5.7
4	Alcohol use disorders	18.4	3.5	4	Alzheimer and other dementias	3.7	5.4
5	Cataracts	17.4	3.3	5	Osteoarthritis	2.8	4.1
6	Schizophrenia	14.8	2.8	6	Refractive errors	2.7	4.0
7	Birth asphyxia and birth trauma	12.9	2.4	7	COPD	2.4	3.5
8	Bipolar disorder	12.9	2.4	8	Diabetes mellitus	2.3	3.4
9	Osteoarthritis	12.8	2.4	9	Asthma	1.8	2.6
10	Iron-deficiency anaemia	12.6	2.4	10	Drug use disorders	1.7	2.4

4.7 DATA EXTRACTION & ANALYSIS

4.7.1 Data Extraction

The data was collected as self-reported observations using primary outcomes and secondary outcome variables. The assessments were done on the first day (baseline data) and end of 14th day (post data). The data was organized in Microsoft Excel Sheets (Version 2010).

4.7.2 Statistical Analysis

4.7.2.1Methods

Data collected were subjected to statistical analysis. Continuous variables are presented as mean (Sd); ordinal and Nominal data are presented as number and percentage. Comparison between the groups was made using student’s T test for quantitative data and chi square test for qualitative data. The Patients characteristics such as Age, Height, and Weight were analyzed by using Student’s t test. The variable sex is analyzed using contingency table analysis with Pearson chi-square test. The WOMAC index among local and special acupuncture groups was analyzed by using Student's t-tests. A value of $P<0.05$ was considered significant.

5.0 RESULTS

There was evidence of a difference in WOMAC index between Local and Specific Acupuncture ($p<0.001$). Mean (SE) for local acupuncture was 43.06 (2.1) and 44.26 (2.4) for specific group with mean difference of -1.10 with 95% CI of -2.25 to 0.05.

There was evidence of a difference in WOMAC pain between Local and Specific Acupuncture ($p<0.001$). Mean (SE) for local acupuncture was 12.13 (1.6) and 11.93(1.1) for specific group with mean difference of 0.20 with 95% CI of -0.49 to 0.89.

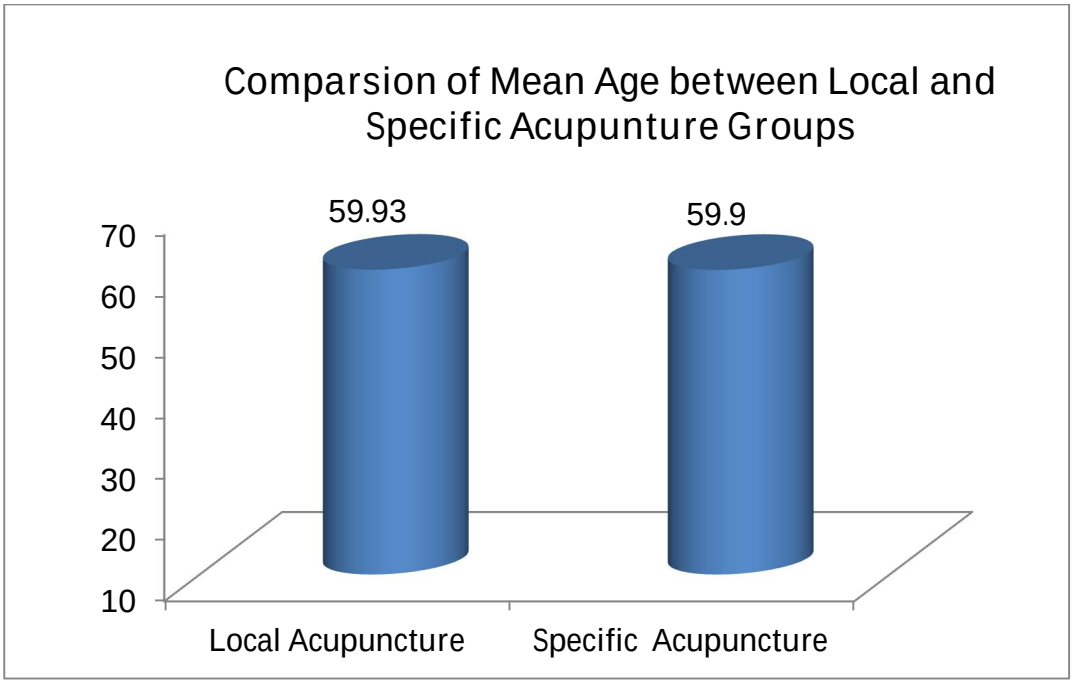
There was no evidence of a difference in WOMAC stiffness score between Local and Specific Acupuncture ($p=0.892$). Mean (SE) for local acupuncture was 4.67 (1.0) and 4.63(0.8) for specific group with mean difference of 0.03 with 95% CI of -0.45 to 0.52.

There was significant evidence of a difference in WOMAC physical fitness score between Local and Specific Acupuncture ($p<0.001$). Mean (SE) for local acupuncture was 26.27 (1.5) and 27.6(1.7) for specific group with mean difference of -1.33 with 95% CI of -2.15 to -0.52.

Table 7 : Baseline Characteristics

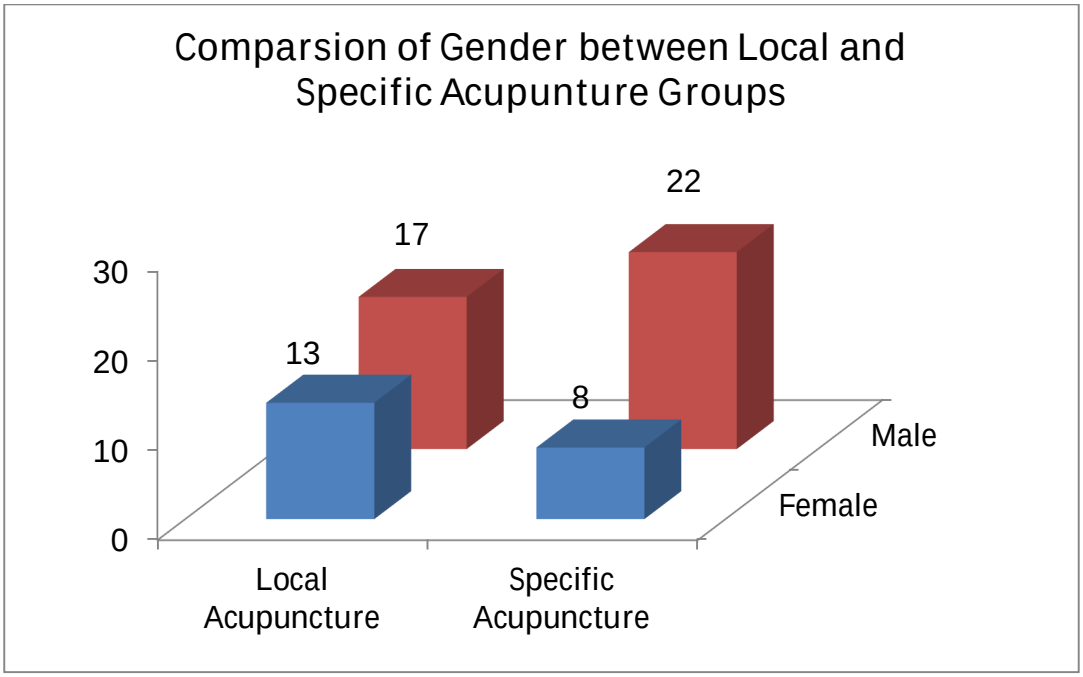
		Local Acupuncture	**Specific Acupuncture**
Age		59.93 (5.8)	59.90(6.64)
Sex	Female	13(43.3%)	8(26.7%)
	Male	17(56.7%)	22(73.3%)
Height		161.57(5.9)	156.77(4.6)
Weight		66.07(9.7)	59.17(6.4)

Diagram : 1



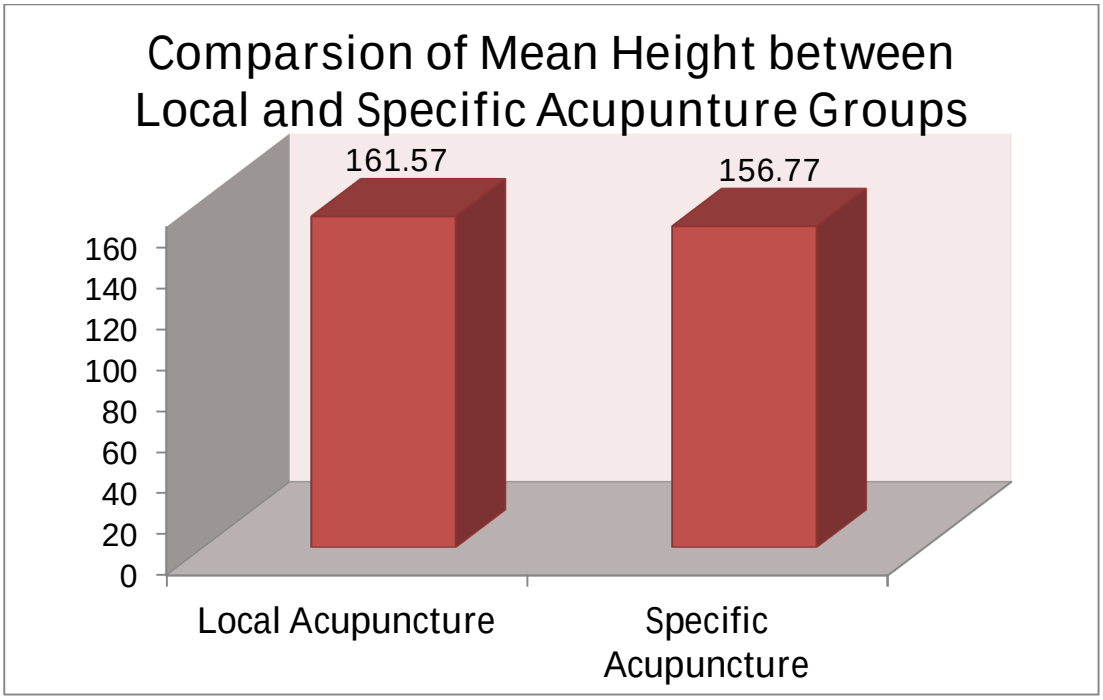
Mean age between the two groups was compare and the statistics explain Local 59.9 and Specific 59.93

Diagram : 2



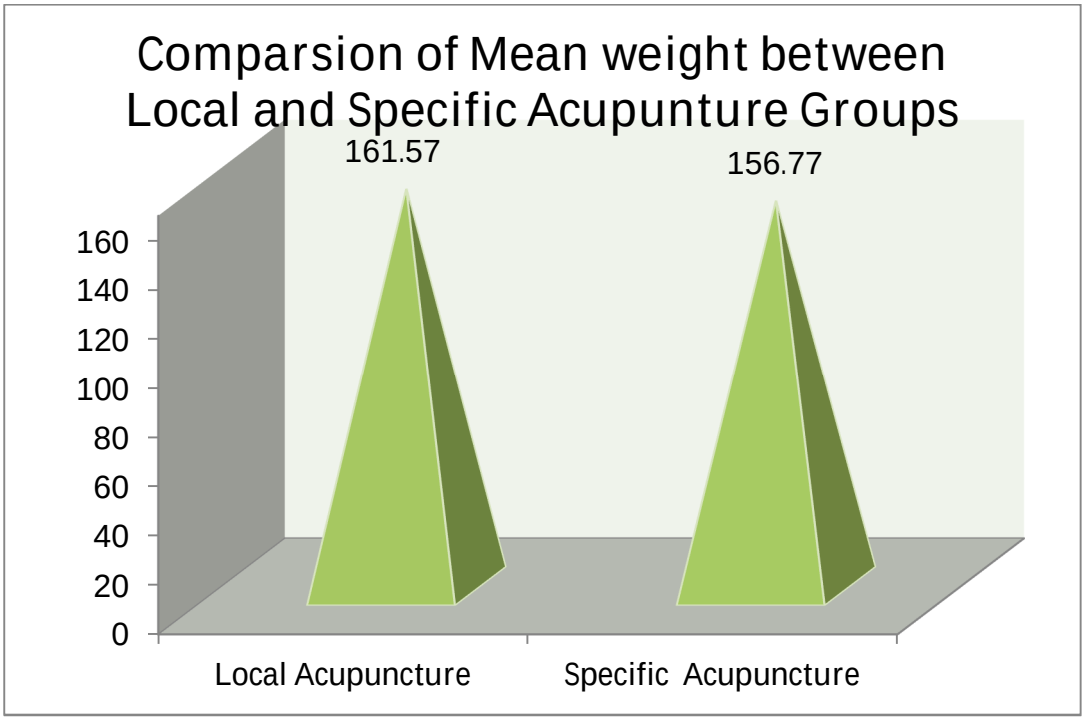
Gender differentiation between the two groups both Male and Female

Diagram : 3



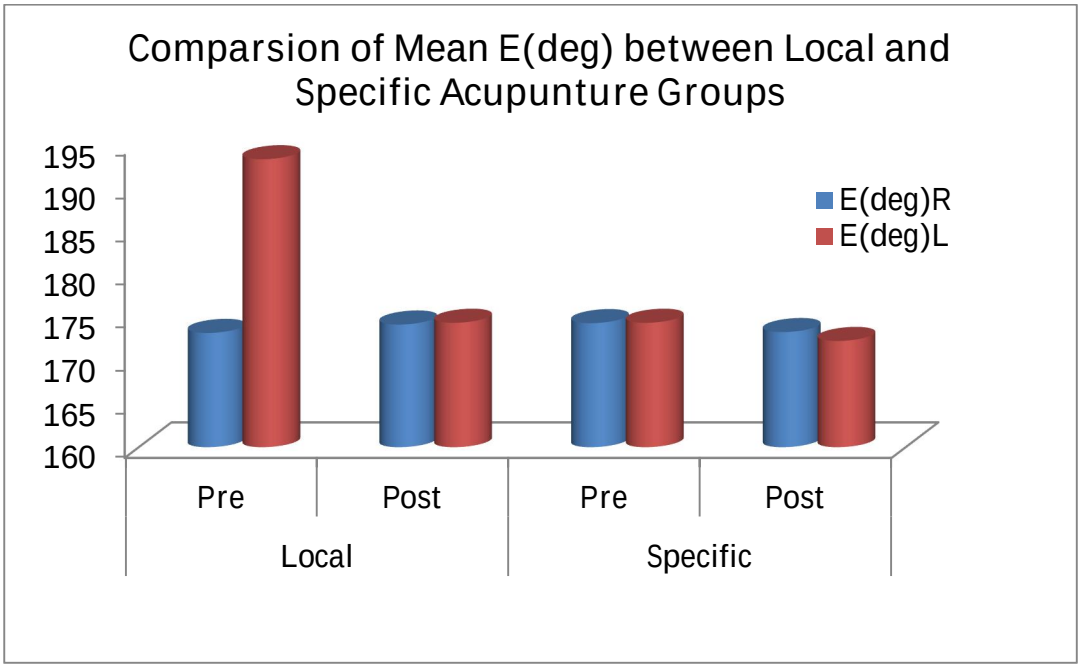
Average Mean Height between two groups Local 161.57 and Specific 156.77

Diagram : 4



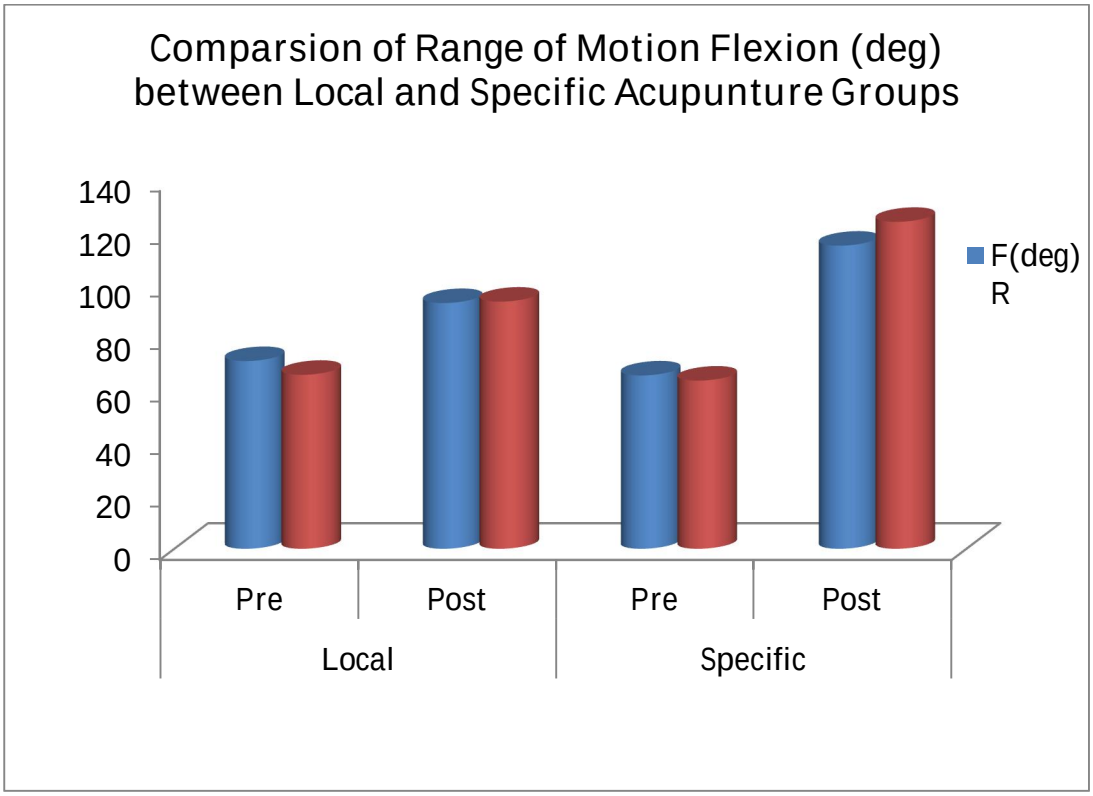
Mean weight between two groups Local 161.57 and Specific 156.77

Diagram : 5



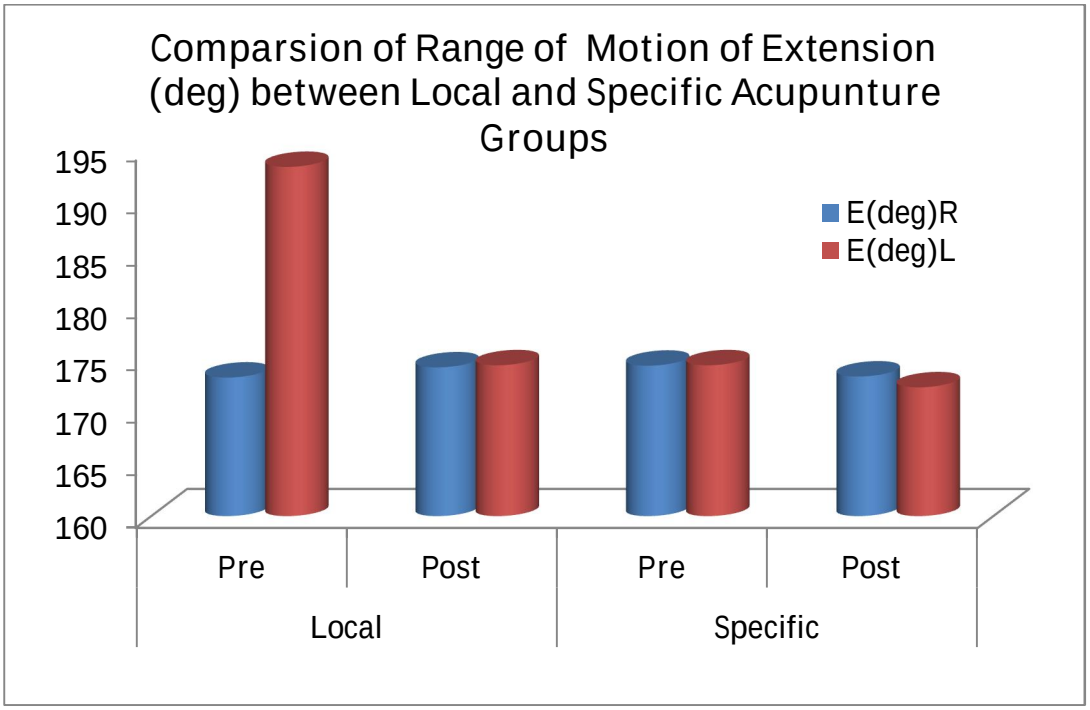
Mean degree of extension between two groups pre and post in both the legs

Diagram : 6



Range of motion between both groups in degrees pre and post

Diagram : 7



Range of Motion of Extension in both group in both legs pre and post test.

There was significant difference in Flexion (deg) of Right leg between Local and Specific Acupuncture ($p<0.01$).

There was significant difference in Extension (deg) of Right leg between Local and Specific Acupuncture ($p<0.01$).

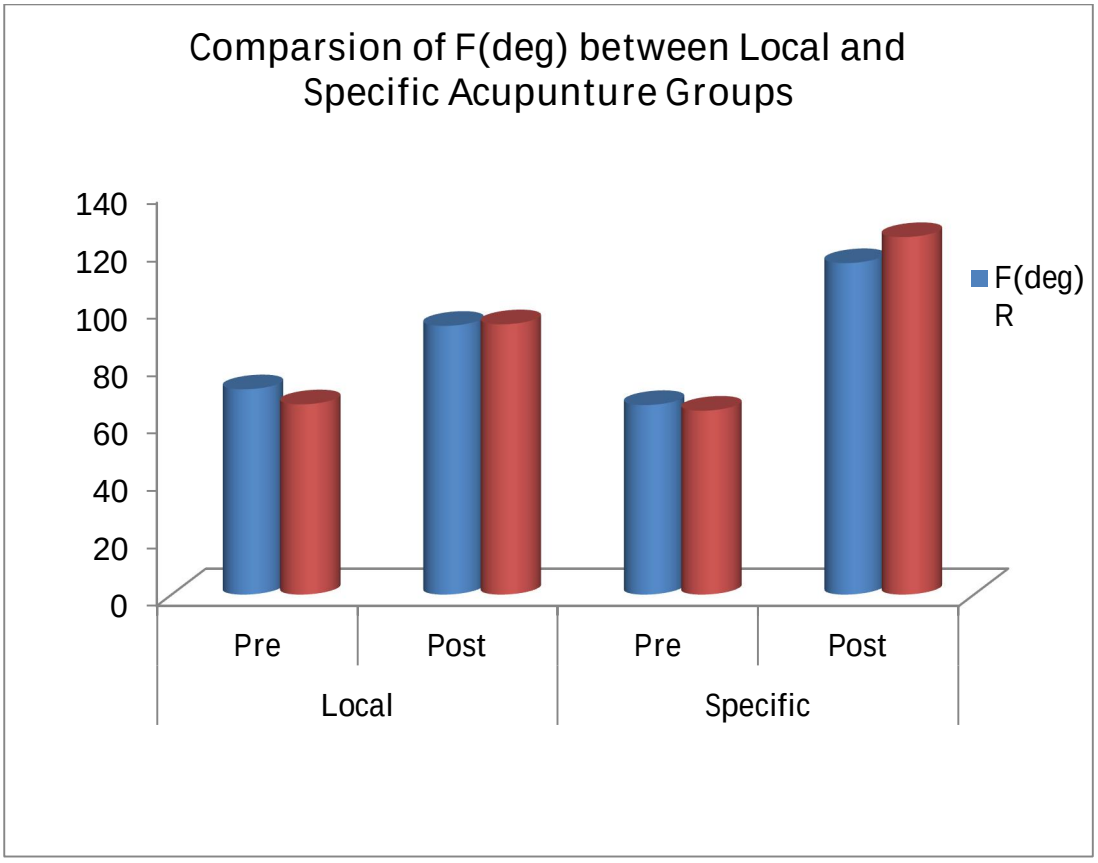
There was significant difference in Flexion (deg) of Left leg between Local and Specific Acupuncture ($p<0.01$).

There was no difference in Extension (deg) of left leg between Local and Specific Acupuncture ($p=0.359$).

Table 8 : Comparison of Local and Specific Acupuncture Group

	Local		**Specific**		**P Value**
	Pre	**Post**	**Pre**	**Post**	
F (deg) R	71.30 (4.6)	93.33 (3.4)	65.83 (2.5)	115.13 (4.2)	0.001
E (deg)R	173.20 (1.8)	174.17 (2.2)	174.33 (2.1)	173.30 (2.8)	0.015
F (deg)L	66.07 (2.5)	93.87 (3.9)	63.87 (1.7)	124.17 (2.1)	0.001
E (deg)L	193.27(98.9)	174.37(1.7)	174.37(1.7)	172.27(2.7)	0.359

Diagram : 8

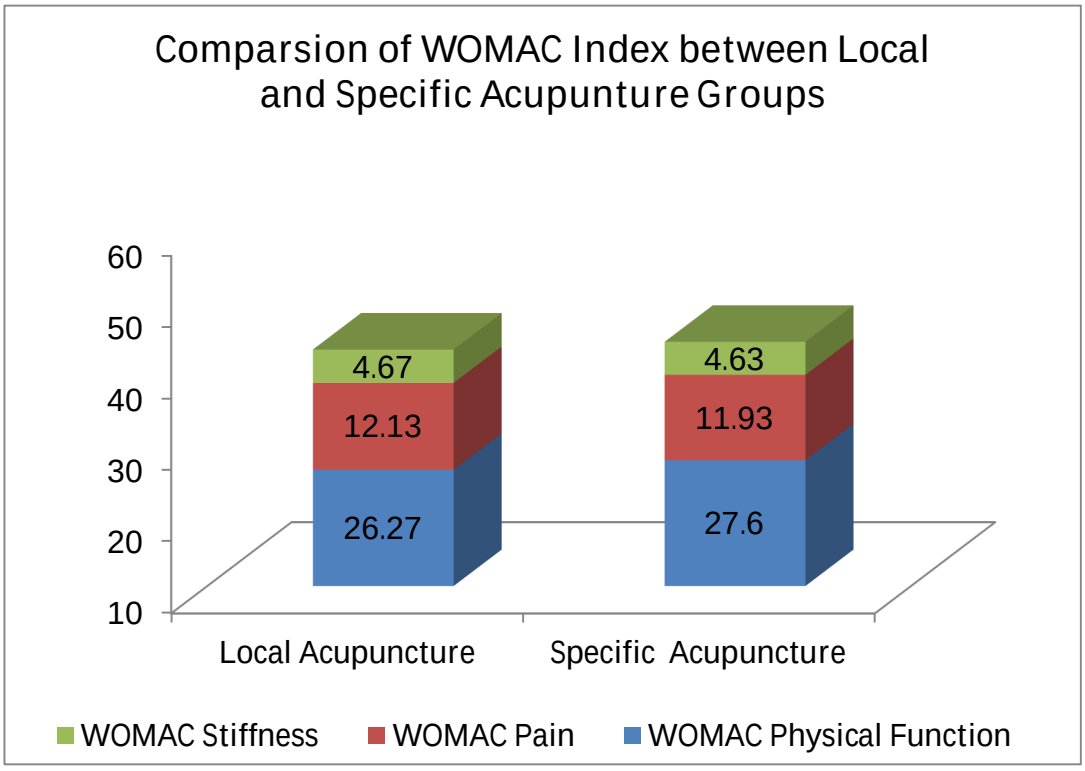


Degree of flexion between both groups in both legs pre and post test.

Table 9 : Womac Index Scoring

	Local Acupuncture	Specific Acupuncture	Local vs Specific Acupuncture	P value
WOMAC Index	43.06 (2.1)	44.16 (2.4)	-1.10 (-2.25 to 0.05)	0.063
WOMAC Pain	12.13 (1.6)	11.93 (1.1)	0.20 (-0.49 to 0.89)	0.568
WOMAC Stiffness	04.67 (1.0)	04.63 (0.8)	0.03 (-0.45 to 0.52)	0.892
WOMAC Physical Function	26.27 (1.5)	27.60 (1.7)	-1.33 (-2.15 to -0.52)	0.002

Diagram : 9



6.0 DISCUSSION

The result of the study revealed that local acupuncture points and the specific acupuncture point groups show significant changes in the post test of primary and secondary outcomes.

The trial was expected to produce clinical evidence that acupuncture is the effective way to relieve the pain and improve the QOL in the subjects. Acupuncture is well established for its effect in the pain relief. As the incidence is increasing mainly in this trial was conducted.

Acupuncture plays a vital role in the pain and motor gate way mechanism in the Osteo arthritis of knee, all the acupuncture points has an healing effect by inducing the neuro muscular action and optimizing the secretion in neurohumoral activity.

In this study there is a significant difference ($p<0.001$) within the local acupuncture group mainly in flexion (Range of motion) in both the legs, in the post test at the end of the 14th day in comparison to the baseline data. However no significant difference in the pain symptom was noticed.

The common management which is taken by most of the subject is the use of NSAIDs. The mechanism behind the use of NSAIDs is by the inhibition of the cyclooxygenase which is an enzyme responsible for the

formation of the muscular movements flexion and extension. The excess of the enzyme is the major reason for the un-rhythmic muscular co-ordination in the knee joint which reduces the blood blow. It is notice in the cases peripheral nerves activities is increased.

There was evidence of changes in the WOMAC INDEX between local and specific acupuncture ($p=0.063$). Within the local acupuncture group showed significant change in the extension in pre test in both the legs 173.20 (1.8).

This study shows a significant increase in the range of movement (flexion) in local acupuncture group in both the legs ($p<0.001$).

In the specific acupuncture group showed significance in the post study in flexion ($p<0.001$) and in the extension ($p=0.359$).

Duration of conducting the intervention to be a key factor in showing positive changes in the results.

Based on the Yin & Yang theory of clinical acupuncture.

6.1. KIDNEY AND LIVER DEFICIENCY NOTIFIES;

- Relives the pressure
- Relives the pain
- Increases weakness of the muscles
- Increases weakness of the Joints
- Decreases co-ordination

6.1.1 Qi and Blood Deficiency Leads

- Increase patients inability
- Increase lack of sleep leads to weakness of mind and blood flow to head.
- Dream disturbed sleep.
- Sometimes increase coldness of the knee joint leads to reduction of muscles tonicity.
- Increase coldness leads to stiffness of joints and articular cartilage.
- Increase space between degeneration of bones.

6.1.2 Qi and Blood Stagnation

Leads to psychological changes in mind that reflects in the body mainly in OAK leads to mild increase in the removable of blood stagnation.

6.1.3 Stagnation of Cold

Leads to increase in the coldness of the joints leads to major accumulation of the muscles and bone density and restriction of the joint movement.

6.1.4 Invasion of Pathogenic Wind

This leads to increase in the pathogenic activity to arrest the movement and circulation. This decrease the warmth of the knee joint which increase suffering of the patient leads to delayness in the recovery. This TCM regains the basic activity of the joint movement by increasing the pathophysiological function.

6.2 EXERCISE THERAPY

House hold works and physical activity by maintaining the basic structures and the Diet for the daily regimen. Marks as a essential pre requisite the increase the ability to maintain normal warmth and articular regeneration. So that the range of motion, pain, stiffness and improvement of physical function as recovery.

6.3 THE QUALITY OF LIFE

Gets improved for both the groups from this clinical acupuncture helped to improve the physical and psychological health, moreover helps in improving the social relationship in the quality of life of people above the age group of 50 both men and women, who suffer very critically as this osteoarthritis of knee as a major disorder.

6.4 LIMITATION

- To generalize the sample study must be relatively increased for the outcomes.
- Effect of the intervention must be more objective to validate.
- All the participants of this study were the inpatient and outpatients of this hospital. Need to generalize research to a diverse group of people.

6.5 FUTURE RESEARCH

To be conducted in a generalized population with a prolonged period of study. To be extended with various interventional level and methods to improve the quality of life (QOL).

To be extended with elderly people mainly the severity of OAK with conventional methods for the speedy and permanent relief and delayness in the occurring of OAK.

7.0 CONCLUSION

The present study showed that 14days of acupuncture point treatment for the study to the local and specific group, shows no significance in pain, reduced the stiffness of muscles and tendons, of the knee joint. Shows significance in the physical function of knee thus improves the range of motion, in the degree of flexion. Pain sensitivity has not been much appreciable in these subjects further research with larger sample size and with other acupressure, herbal remedy techniques aids to reveal accurate changes in this field.

Selection of acupuncture points based on the clinical method have a significance in the physical function and range of motion to extend improving the quality of life in the elderly people of OAK as a very safe and effective method of treatment as a holistic approach.

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3. Current author addresses and author contributions are available at www .annals.org.

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9.0 ANNEXURE

INFORMED CONSENT FORM

Government Yoga and Naturopathy Medical College & Hospital, Arumbakkam, Chennai.

Participant's Name: ----------

Title of Study	"Effect of Specific Acupuncture & Local Acupuncture points on Osteoarthritis of knee - A comparitive clinical study"

Researcher	**Dr.K.Sathyam,** M.D in A & EM , Department of Acupuncture and Energy Medicine, Govt. Yoga and Naturopathy medical college, Chennai.

I have been invited to participate in the research of **"effect of specific acupuncture and local acupuncture points on osteoarthritis of knee- A comparative clinical study "** I understand that it will involve the practice of puncturing with sterile needles, which may be useful for my well-being.

I have been informed that there will be pre and post assessments where non-invasive methods will be used to measure range of motion using goniometer and WOMAC questionnaire.

I am aware that there may be no benefit to me personally and that I will not be compensated whatsoever.

I had given the opportunity to ask questions about the study and the questions what I asked have been answered to my satisfaction.

I understand that I have the right to withdraw from the research at any time without affecting my medical care or legal rights.

Hereby, I confirm that I have understood the above study. I myself consciously give consent to participant in this study.

Date : Signature: _____

I have accurately read or witnessed the accurate reading of the consent form to the potential participant, and the individual has given opportunity to ask questions. I confirm that the individual has given consent consciously.

Researcher :

Date : Signature: _____

ANNEXURE

ANNEXURE 1 : ACUPUNCTURE CLINICAL CASE SHEET

Date ……

Name ……. IP/OP No…….

Age …….. Sex …… Marital Status ……

Address ……..

……..

Present Complaints :

History of Present Complaints :

Past History :

Medical / Drug History

Menstrual History

Personal History

Diet	Appetite	Digestion
Sleep	Micturition	Bowel Movements
Addiction	Exercise	Thirst

Vital Data

Blood Pressure mm/Hg Pulse Rate : beats/min

Respiratory Rate cycles/min Temperature

Anthropometric Measures

Height cms Weight Kges BMI

Degree of Flexion

Degree of Extension

Provisional Diagnosis

Treatment Chart (Pre & Post)

Day	Local Acupuncture Point	Specific Acupuncture Point
Day - 1		
Day – 2		
Day – 3		
Day – 4		
Day – 5		
Day – 6		
Day – 7		
Day – 8		
Day – 9		
Day – 10		
Day – 11		
Day – 12		
Day – 13		
Day – 14		

ANNEXURE 2 : TRADITIONAL CHINES MEDICINE (TCM)

Date ……

Name ……. IP/OP No……

Age …….. Sex …… Marital Status …….

Address ……..

……

Present Complaints :

History of Present Complaints :

Past History :

Medical / Drug History

Menstrual History

Personal History

Diet	Appetite	Digestion
Sleep	Micturition	Bowel Movements
Addiction	Exercise	Thirst

Vital Data

Blood Pressure	mm/Hg	Pulse Rate : beats/min
Respiratory Rate	cycles/min	Temperature

Anthropometric Measures

Heightcms Weight Kges BMI

TCM Syndrome Variation

Kidney / Liver / Spleen Qi Deficiency	Qi & Blood Stagnation	QI & Blood Deficiency	Stagnation of Cold	Invasion of Pathogenic Wind
Pain				
Stiffness				
Physical Function				

Provisional Diagnosis

Treatment Chart (Pre & Post)

Day	Local Acupuncture Point	Specific Acupuncture Point
Day - 1		
Day – 2		
Day – 3		
Day – 4		
Day – 5		
Day – 6		
Day – 7		
Day – 8		
Day – 9		
Day – 10		
Day – 11		
Day – 12		
Day – 13		
Day – 14		

10.0 QUESTIONNAIRE

ANNEXURE : 3

The Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC)

Name : Date :

Instructions : Please rate the activities in each category according to the following scale of difficulty. 0 = None, 1 = Single, 2 = Moderate, 3 = Very, 4 = Extremely.

Circle One Number for each activity

Pain	1.Walking	0	1	2	3	4
	2.Stair Climbing	0	1	2	3	4
	3.Nocturnal	0	1	2	3	4
	4.Rest	0	1	2	3	4
	5.Weight Bearing	0	1	2	3	4
Stiffness	1.Moming Stiffness	0	1	2	3	4
	2.Stiffness Occurring later in the day	0	1	2	3	4
Physical Function	1.Descending Stairs	0	1	2	3	4
	2.Ascending Stairs	0	1	2	3	4
	3.Rising from Sitting	0	1	2	3	4
	4.Standing	0	1	2	3	4
	5.Bending to floor	0	1	2	3	4
	6.Walking on flat surface	0	1	2	3	4
	7.Getting in / out of car	0	1	2	3	4
	8.Going Shopping	0	1	2	3	4
	9.Putting on Socks	0	1	2	3	4
	10.Lying in bed	0	1	2	3	4
	11.Taking off socks	0	1	2	3	4
	12.Rising from bed	0	1	2	3	4
	13.Getting in / out of bath	0	1	2	3	4
	14.Sitting	0	1	2	3	4
	15.Getting on / off toilet	0	1	2	3	4
	16.Heavy domestic duties	0	1	2	3	4
	17.Light domestic duties	0	1	2	3	4

Total Score _____ / 96 = _____ %

Comments / Interpretation (to be completed by the therapist only)